Sa: Jeake 1697

A GOOD=LY GALLERYE

WITH A MOST PLEA=saunt Prospect, into the garden of naturall contemplation, to behold the naturall cau=ses of all kynde of *Meteors*, as wel fyery and ayery, as watry and earthly, of whiche sort be blasing sterres, shooting starres, flames in the ayre &c. thōder, lightning, earthquakes, &c. rayne dewe, snowe, cloudes, springes &c. stones, me=talles, earthes &c. to the glory of God, and the profit of his crea=turs.

¶ *PSALM. 148.*

Prayse the Lorde vpon earth Dragons and all deepes, Fyre, Haile, Snowe, Ise, Wyndes, and stormes, that doe his wyll.

LONDINI.
Anno. 1563.

(.·.)

TO THE RIGHT HONORABLE THE LORDE Robert Dudley, Maister of the Quenes maiesties horse, Knight of the most Noble order of the garter, and one of the Quenes maiesties priuie Counsell. William Fulce, wisheth increase of grace and heauenly gifties, in perfect health and true honor, long to continue.

THE mooſt myghtye Monaychie of the Romain Empire Octauius Auguſtus, (ryghte honourable Lord) did ſhewe ſo great liberalitie, or rather magnificence towardes all them that bare him good will, that he alſo moſt largely rewarded ſondry perſones ẏ had tought Popingayes and other birdes, to pronounce ſome ſalutation (as he paſſed by them) in his prayſe & commendation. At the length a poore yonge man, allured (as it ſæmed) by his bountifull remuneration of other: had tought a Crowe (an vntowardly byrde) after the ſame manner to ſalute themperour. Who perceiuing

ning his purpose, that it was rather for hope of gayne, then testimony of good wyll: answered that he had store inough already, of suche saluters at home, meaning those Popingayes & other birdes, which at the first for their strangenes, he had dearly payed for. In lyke manner (right honorable Lorde) when I present the salutation of this myne vntowardly byrde, a Crowe in comparison of suche pleasaunt popingayes, as haue been hetofore offered vnto your honorable Lordship: you may haue iust cause of suspition, that being moued with your former liberalitie & magnificence towards other, I doe as the Poet sayeth:

Occultum cautus decurrere piscis ad hamum.

And so if your gentle nature and noble dispositiō could suffer, as a crauer of vndeserued benefites, to reiect both me & my present. But sith my state is such, that I can not testifie the good wyll of myne heart towardes your honour, otherwyse then by such meanes as this: I was bolde to referre that suspition to the iudgement of your wysdome and humanitie (knowing my selfe cleare from suche intent) and to commit this vnbewtifull

tifull byrd, vnder the wynges of youre honorable protection, trusting that the same (whiche I take as a commen defence of all good learning) shall not only at this time be my stay & refuge, but also hereafter to more worthy attempts a continual encouragement. But specially at this tyme, I was bolde to enterprise the matter, for that one *Iames Rowbothum*, a man of notable impudens (that I saye no worse of him abusinge your singular humanitie and gentlenes erpressing therample of one *Bathillus*, or rather (that I may continue in the allegorie of birdes) of *Esopes* crowe, hath not ben ashamed to dedicate vnto your Lordship of late a treatise of myne, which I gathered out of diuerse writers, concerning the *Philosophers game*: notwithstanding he was streightly commaunded to the contrary by the right honorable and reuerent father, my Lord of London, of whome also I was exhorted and encouraged to dedicate the same vnto your honour, my selfe. Whiche though nowe through his importunitie & disobediēce, it be intercepted, and the booke defaced with his rude rythmes & peuish verses:

yet

yet I thought best to geue your Lordeship vnderstanding that your honorable protection which is and should be the defence of learning & learned men, might no more be a boldening to such ignorant and vnhonest persones. And like wyse most humbly to desire your honour that though myne Epistle dedicatory, be not annexed to that booke, yet considring by what pertinacitie I was hindered, you would accept that booke also together w̄ this, as an homely present of myne, of which I may conclude as one did in like case.

Illum ego cōposui libru̅, tulit alter honori
Sic vos non vobis lacte tumetis oues.
Sic vos non vobis præda agit ampla canes
Sic vos non vobis conditis antra feræ,
Sic vos non vobis pondera fertis equi.

Thus sparing to trouble your honour any lōger, either w̄ cōplaint or excuse, I desyre almightie God to multiplie his blessinges toward you, that abounding in all good giftes bothe bodely and ghostly, you may haue long life in health and honour, to his glory, the profit of other, and your endles comfort. Amen.

The first Booke.

FOr as muche as we entend in this treatise, to declare ỹ causes of all those bodyes, that are generatede in the earthe, called *Fossilia*, as well as thos other *Impressiones*, named of ther height, *Meteora* (which no wryter hetherto hath done, ỹ we haue sene) the comen definicion gyuen by most wryters, in no wyse wyll serue vs, & whether we maye borowe ỹ name of *meteoron* to comprehende the whole subiect of oure worke we are not all together out of doubt, all thoughe ỹ philosopher, deryuinge it from doutfullnes, geueth vs som colloure so to take it, and paduenture we myght be as wele excused to aplye it to *mineralls*; as other auters ar to vse it for earthequakes: yet to auoyde all occasions of cauellynge at wordes, we shall bothe defyne and alls describe the subiect of oure matter on thys manner: yt is a body compounde with out lyfe naturalle: and yet to stoppe one hole, because heare wanteth ỹ name of ỹ thinge to be destinede, yt is no newe thinge, to theim that haue redde *Aristoteles* workes to fynde a diffinition, of that whereof ther is no *Aristoteles.*

is no name. But what nede you be so pre-
cise (will some man say) mean you so to pro-
ceade in all your discourse? no verely, but
because many of quicke iudgement not cō-
sidering the stile to be attempered, to the ca-
pacitie of the Readers, will impute the
plaines to the ignorannce of the authors,
we thought good in ỹ beginniug to pluck
that opinion out of their mindes (that as
the cōmon saying is) they may know we
haue skill of good maners though we litle
vse them.

These meteors are deuided after thre ma-
ner of ways, first into bodies pfectly & imp-
fectly mixed. Secondly into moist impres-
siōs & drie. Thirdly into fiery, aery, watery
and earthly. Accoрding to this last diuisiō,
we shall speake of them in folwre bookes
followyng. But first, we must be occupied
a litle in the general descriptiō of the same,
ỹ afterward shalbe particularly intreated
of. ¶ *Why they be called vnperfectly mixed.*

They are called vnperfectly mixed, be-
cause they are very sone chaūged into
another thing, and resolued into their
proper elementes of whiche they do moste
consist, as do all impressious, fyrie, ayrie,
watrie, as snowe into water, cloudes into
waters

waters. &c.

¶ *Why they be called perfectly mixed.*

The last sort namely earthly, *Meteores* are called perfectly mixed, because they will not easely be chaunged and resolued from that forme which they are in, as be stones, metalles and other mineralles.

According to the qualitie of the matter, they are diuided into moist & drie impressions, consisting either of *vapores* or *exhalations*. *vapores* are called moist, and *exhalations* drie, whiche termes must be well noted, because they must be much vsed.

¶ *Of the general cause of al Meteores and first of the materiall cause.*

The mater whereof the moste part of *Meteores* dooth consiste, is either water or earth, for out of ỹ water, proceade vapors, and out of the earth come erhalations. *The materiall cause.*

Vapor as the Philosopher sayeth, is a certain watrie thing, and yet is not water, so erhalation hath a certain earthly nature in it, but yet it is not yearth. *What be vapors & what exhalations.*

For the better vnderstanding of vapors, vnderstande that they be as it were fumes or smokes, warme & moist, whiche will easely be resolued into water, muche like to the breath that proceadeth out of a

mans mouth, or out of a pot of water standing on ẏ fiere. These vapors are drawen vp from the waters and watry places, by the heate of the Sunne, euen vnto the midle region of the ayre, and there after diuerse maner of meating with coldnes, many kynde of moist *Meteors* are generated, as sometime cloudes and rayne, sometime snowe and hayle, and that suche *vapors* are so drawen vp by the Sunne, it is playne by experiẽce: for if there be a plash of water on a smothe and hard stoone, standing in the heate of the sunne, it wyl soone be drye, whiche is none otherwyse, but ẏ the sonne draweth vp the water in thinne *vapores*, for no man is so fonde to saye, that it can sinke into stoone or metall, and it is as great foly to thinke, it is consumed to nothyng: for it is a general rule, that that whiche is once a thing, can not by chaunging become nothyng, wherefore it followeth that the water on the stoone, as also on the earth, is for the moste part drawen vp, when the stoone or earth is dried

What the midle region is shalbe tolde afterward.

A generall rule.

Exhalations, are as smokes that be hoat and drie, whiche because they be thinne, & lygther then *vapors*, passe the lowest and midle region of the ayre, and are caried vp euen to the highest region, where for the excessiue heat, by nearenes of the fier, they

What exhalations bee.

are kindled, and cause many kinde of impressions. They ar also sometimes *viscose*, that is to say clãmy, by reason wherof, thei cleuing together & not beingdispersed, are after diuerse sortes set on fier, and appeare somtimes like Dragõs, somtim like Goats somtime like cãdels somtime like speares.

By ỹ which is spokẽ of *vapors & exhalations*, it is euidẽt ỹ out of ỹ fier & theayer no matter wherof *meteores* shold consist can be drawẽ, because of their subtiltie & thinnes. For al *exhalatiõ* is by making a grosser body more thinne, but ỹ fier (we mean ỹ elemẽtal fier, & not the fire of the kitchẽ chimney) is so subtil & thin, ỹ it cannot be made thinner: likewise the ayre is so thin, ỹ if it be made thinner, it is chãged into fire, & as the fire if it wer made thicker, wold becom aire, so the aire, being made grosser, wold be turned into water. Wherfor to cõclude this part, ỹ great quantitie of matter, that causeth these *meteores*, is takẽ out of ỹ earth and the water. As for ỹ aire & the fire, they ar mixed with this matter as with al other things, but not so abundauntly, that they may be sayd the material cause of any *Meteore*, though without them none can be generated. The efficient cause of all *Meteores* is that cause, whiche maketh them, euen *The efficiẽt cause*

as the Carpenter is the efficient cause of an house. This cause is ether first or secõd.

The first and efficient cause is god, the worker of all wonders, accordinge to that testimony of the Psalmist, whiche sayeth. Fier, haile, snowe, yse, wynde and stones, do his will and commaundement, he sendeth snowe lyke woll, &c. Almightie God therfore beinge the firste, principall and vniuersall cause efficiente of all naturall workes and effectes, is also the first cause of these effectes, whose profit is great, and operation maruelous.

The second cause efficient, is double, either remote that is to saye, farre of, or next of al. The farther cause of them as of all other natural effectes, are the same, the sonne, with ẏ other planetes and sterres, and the very heauen it selfe in which they are moued. But chiefly, the Sunne by whose heate all or at lest wyse, the moste part of the vapors and exhalations are drawen vp.

The nexte causes efficient as the firste qualities, ar heate and colde, whiche cause diuerse effectes in vapors and exhalations, but to retorne to the heate of the Sunne, whiche is a very neare cause, it is for this

purpose

purpose two wayes considered.

One waye, as it is meane & temperate

Otherwise, as it is vehemēt & burning

The meane, is by whiche he drawēth vapors out of the water and exhalations out of the earth, and not onely drawēth them out, but also lifteth them vp very high frō the earth, into the ayer, where they ar tornēd into diuerse kinde of *Meteores*.

The burning heate of the Sunne is, by which he burneth dissipateth and consumeth the vapors, and exhalations before he drawēth them vp, so that of them no *Meteors* can be generated.

These two heates, proceade from the Sunne either in respect of the place, or the tyme, but moste properly according to the rasting of his beames either directly or vndirectly.

In places where the Sunnes beames strike directly against the earth, and the water, the heat is so great, that it burneth vp the exhalatiōs and vapors, so that there are no fiery *Meteors*, muche lesse watery as it is in the South partes of the world, vnder and neare to the Equinoctiall lyne.

But in places where the beames are cast indirectly, and obliquely, & that where

they are not to nyghe to the direct beames, nor to farre of from them: there is a moderate heate, drawyng out great aboundaunce of matter, so that in those contries, many *Meteores* of many sortes as generated, as in the farre North partes are fewe, but watrie impressions. Also in *Autumne* & Spryngе, are oftener *Meteores* seen, then in Sommer and Wynter, except it be in such places, where the Sommer and Wynter are of the temper of Spryng and *Autūne*. Let this be sufficient, for the efficient causes of impressions, as well first and principall, as second and particular. Concerning the formall and finall cause, we haue litle to saye because the one is so secret, that it is knowen of no mā, ẏ other so euidēt ẏ it is playne to all men. The essentiall forme of all substaunces, Gods wisdome comprehendeth, the vniuersall chiefe and last end of all thinges, is the glory of God. Myxte endes (if they may be so called) of these impressions are manifold profites, to Gods creatures, to make the earth fruitfull, to purge the ayre, to sett forth his power, to threathen his vengeaunce, to punyshe the worlde, to moue to repentaunce: all the which are referde to one end of Gods eternall glory, euer to be praysed. Amen.

¶ *Of the places, in whiche they are generated.*

THe places in whiche *Meteors* are raised, be either the ayre or the earth, in ỹ aire be generated rayne, hayle, snow, dew, blasing starres, thonder, lightning &c. In the earth be welles, spryngs, earthquakes, metalls minerals, &c. made, and as it were in their mothers belly begotten & fashioned. But for the better vnderstanding hereof, such as haue not tasted ỹ principles of *Philosophie*, must cõsider ỹ ther be iiij. elemẽts, Earth, water, Ayre, & Fire, one cõpassing another round about, sauing ỹ the waters by Gods cõmaundement ar gathered into one place, ỹ the land might apeare. The highest is ỹ spere of the fire, which toucheth the hollownes of the Mones heauen, the nexte is the ayre, whiche is in the hallowwes of the fyer, the ayre within his hollownes, comprehendeth the water and the earth, whiche bothe make but one *Spheare* or *Globe*, or as the commen sort may vnderstande it one Bal. So ethe elemẽt is wĩn another as ỹ skales of a perle, ar on aboue another, or (to vse a grosse similitude) as ỹ pieles of an onĩõ, ar one wĩn ãother, after ỹ same sort frõ ỹ highest heuẽ to ỹ earth, ỹ is lowest, one part ỹ is greater compasseth

roūd about another that is lesser. But for this present purpose it is to be knowen, ẏ the ayer is diuided into thre regions, ẏ hyghest, the midle, and the lowest. The hyghest, because it is next to the region of ẏ fier, is exceading hoate, the lowest beinge next the earth and the waters, is temperat, and by *repercussion* or striking back of the sunne beames wareth hoate, and by absence of them is made colde, being subiect to Wynter and Sommer. The midle region of ẏ ayre, is always exceading cold, partly because ẏ sonnebeames, can not be cast back so highe, and partly because the cold that is there, betwene ẏ heate aboue and the heate beneath it, is so kept in that it can not get out, so that it must nedes be excessiuely colde. For the water and the earthe being both colde elementes, after the sunnesetting in the nighte season doe coole ẏ aire, euen to the midle regiō. But in the morning the sunne rysing warmeth ẏ ayre, so farre as his beames whiche are beaten back from the earth & the water, can extende and reache, whiche is not so highe as the midle region, and by heate on both sides, is inclosed and kept, sauing that a litle thereof falleth downe in the night,

What the regions of the aire be

which

which the nexte day with much moze is dri-uen backe againe. Wherefoze this region being so colde, is darke and cloudye, in so much that some doting Diuines haue imagined, purgatozie to be there in the mydle region of the ayze.

In the hyghest region, be generated *Cometes* oz blasing starres, and suche lyke of diuerse soztes.

In the midle region cloudes, rayne, stozmes, wyndes. &c. In the lowest region, dewe, frost, hozefrost, mistes, bzyght rods, candels burning about graues, & gallowes, where ther is stoze of clamy fatty oz oyly substaunce, also lightes and flammyng fiers, séene in fieldes, &c.

¶ And thus muche foz the generall causes of all *Meteores*.

The seconde Booke of fyery *Meteores*.

A Fiery impression, is an ex*halation* sett on fire, in the highest or lowest region of the ayre, or els apearing as though it were set on fire and burning.

They are therfore diuided into flames and aparitions. Flames are they, whiche burne in deade and are kindled with fire. These are discerned by iiij. wayes, by the fashion of them, by their place, by the abūdaunce of their matter, & by the wante of their matter. Their placing is after the aboundaunce & scarsetie of the matter wher of they consist, for if it be great, heauie and grosse, it cannot be caried so farre as the midle region of the aire, and therfore is set on fire in the lowest region, if it be not so great, light, and full of heat, it passeth the midle region & ascendeth to the highest, where it is easely kindled & set on fire.

Accoрding to their diuerse fashiōs, they haue diuers names, for they ar called, burning stoble, torches, daunsing or leapinge Goates, shooting or falling starres, or candels,

dels, burning beames, roūd pillers, spears shieldes, globes or bowles, fierbrandes, lāpes, flying dragōs or firedrakes, pointed pillors or broched steples, or blasing starrs, called *Cometes*. The time whē these impressiōs doth most apere, is ẏ night season, for if they were caused in ẏ day time, thei cold not be sēen, no more then ẏ starres be sēen, because the light of ẏ suune which is much greater, dimmeth ẏ brightnes of thē being lesser.

¶ *Of the generation of the impression, called burned stoble or sparcles of fire.*

The generation of this *Meteore* is this, whan the matter of the *Exhalation* is in all partes a lyke thynne, but not compacted or knit together, then some parte of it being caried vp into the highest region, by the fiery heate is set on fier before another part, that commeth vp after it, and so being kindled by lytle and lytle, it flyeth abroode lyke sparkles out of a chymney, in so much that the common people suppose, that an infinit number of starres fal down where as it is nothing els, but the *Exhalation* that is thinne kindled in many partes, sparkling as when sawe dust or cole dust is cast into the fyre. *Sparkes of fyre.*

Of

¶ *Of Torches.*

Torches. TOrches or fyer brandes, are thus generated: when the matter of the exhalation is long and not broad, being kyndled at one ende therof, in the highest region of the ayre, it burneth lyke a Torche or fyer brande, and so continueth, till all the matter be burned vp, and then goeth out, none otherwyse then a Torche when all the stuffe is spent must nedes burne no lōger.

¶ *Of dansyng or leaping Goates.*

Dansing Goates. DAnsyng Goates, are caused when the exalation is diuided into two partes, as when two torches be seen together, & the flame appeareth to leape or dasce frō one parte to the other, much lyke as balls of wylde fyer daunce vp and downe in the water.

¶ *Of shotyng and falling Starres.*

Shootinge starres. A Flying, shoting, or falling Starre, is when the exhalation being gathered as it were on a round heape, and yet not throughly compacted in the hyghest parte of the lowest region of the ayer, beynge kyndled, by the soden colde of the mydle region is beaten backe, and so appeareth as though a Starre should fall, or flyde from place to place. Sometyme it is generated

after

after another sort, for there is an exhalatiõ long and narrowe, whiche being kyndled at one ende burneth swiftly, the fyer ronning from ende to ende, as when a silke thread is set on fyer at the one end. Some saye it is not so much set on fyer, as that it is direct vnder some Starre in the firmament, and so receiuing light of that starre, semeth to our eyes to be a starre. In deade some times it may be so, but that is not so alwayes, nor yet most cõmenly, as it may be easely demonstrated. The *Epicurians* as they are verye grosse in determining the chief goodnes, so they are very fonde in assigning the cause of this *Meteor*. For they say, ỹ the starres fall out of the firmamẽt, and that by the fall of them, both thonder and lyghtning are causeD: for the lightening (say they) is nothyng els but the shyning of that starre that falleth, which falling into a watrie cloude, and being quẽched in it, causeth that great thonder, euen as whoat yron maketh a noyce if it be cast into colde water. But it is euident that ỹ starres of the firmament can not fall, for God hath set them fast for euer, he hath geuen them a commaundement whiche they shal not passe. And though they shold

The Epicurians opinion.

Psal. 148

fall

fall into the cloude, yet could they not rest there, but with their weyght being dryuen downe, would couer the whole yearth.

The greatnes of Starres. For the least starre that is seen in the firmamēt, is greater then all the earth. Here wyl steppe forth some mery fellow, which of his conscience thinketh them not to bee aboue three yardes about, and saye it is a loude lye, for he can see within the cōpasse of a bushell more then xx. starres. But if his bushell were on fyre xx. myle of, I demaunde how bygge it would seem vnto him: He that hath any wyt, wil easely perceiue, that starres being by al mennes confessiō, so many thousand myles distant from the earth, must needes be very great, that so farre of should be seen in any quantitie. Thus muche for the shotyng or fallynge Starres.

A profe of the stars greatnes.

¶ *Of burnyng Candels.*

Burning candels. When the *Exhalation* caried vp into the hyghest part of the ayre is in al partes thereof of equall and lyke thynnes, & also long, but not broade, it is set on fyre and blased lyke a candle, vntyll the *Exhalation* be quite consumed.

Burnynge beames & roundpillers.

¶ *Of burning Beames and round Pillers.*

These are caused, when the *Exhalation* being

being long and not very broade, is sett on fyre, all at once and so burneth lyke a great beame or logge. The difference of beames and pyllers is this, for beames are when they seeme to lie in lengthe, in the ayre, but they are called pillers, when they stande right vp, the one end nearer to the earth, then the other.

¶ *Of burning Speares.*

BUrning spears are generated, when a great quantitie of *Exhalatiõs*, which may be called a drie cloude, is set on fire in the myddest, and because the cloude is not so compacte, that it shoulde sodenly rende, as when thonder is caused, the fyre breaketh out, at the edges of the clowde, kendlyng the thynne *Exhalations*, which shot out in great nũber lyke fyry speares, or dartes, longe and very small, wherfore they continue not long, but whẽ they fayle, within a short whyle after, more fyre breakynge out, they shot out as many more in their place, and lykewyse, whẽ they ar gone, other succeade, if the quantitie of the matter will suffise, more then a dosen courses. This impression was seen in Lõdon, *Anno dom.* 1560. the thirty daye of

Burninge Spearcs.

Ianuary, at eight of the clocke at night the ayer in all other places beyng very darke, but in the North east where this cloude burned, it was as lyght as when the daye breaketh, towarde the Sunne ryſyng, in ſo much, that playne ſhadowes of thyngs oppoſite, was ſeen. The edge of this cloude was in faſhion lyke the Raynbowe, but in collour very bryght, and often tymes caſting forth almoſt innumerable dartes, of wōderfull lēgth lyke ſquybbes, that are caſt vp into the ayre, ſauing ẏ they moued more ſwiftly then any ſquybbes.

¶ *Of ſhieldes. Globes or Bowles.*

Shieldes Globes or Bowels. These *Meteores* alſo haue their name of their faſhion, becauſe they are broad, and appeare to be rounde, otherwyſe their generation differeth not frō the cauſe of the lyke impreſſions before mentioned.

¶ *Of Lampes.*

Lampes. The lampe cōſiſteth of an *Exhalation*, ẏ is broade & thick, but not equally extended, namely ſmaller at one end then at another, which being kindled about ẏ middeſt therof, burneth like a lāpe. The cauſe why, as wel this impreſſiō, as many other, apeareth round, is not for ẏ alwayes they ar roūd in dēde, but becauſe

the great distance causeth thē to seem so. For euen square formes, farr of seem to be roūd. It is written, ẏ a lāpe fel down at Rome whē *Germanicus Cesar*, set forth the sight of swords players.

Of flying Dragons or fyre Drakes.

Flyinge Dragons or fyre Drakes.

FLying Dragons, or as Englyshmen call thē fire drakes, be caused on this maner. When a certen quātitie of *vapors* ar gathered on a heape, being very near cōpact, & as it wer hard tēpered together this lōpe of *vapors* assending to ẏ region of cold, is forcibly beaten backe, whiche violēce of mouing, is sufficient to kindle it, (although sōme men will haue it to be caused betwene ẏ. cloudes a whote & a cold) thē ẏ highest part, which was climming vpward, being by reason more subtil & thin, apeareth as ẏ Dragons nekk, smokig, for ẏ it was lately in the repuls bowed or made crooked, to represent the dragōs bely. The last part by ẏ same repulse, turned vpward, maketh ẏ tayle, both apearig smaller, for ẏ it is farther of, & also, for ẏ the cold bindeth it. This dragō thus being caused, flyeth alōg in ẏ ayre, & sōtime turneth to & fro, if it meat wᵗ a cold cloud to beat it back, to ẏ great

terroꝛ, of them that beholde it, of whom some called it a fyꝛe Dꝛake, some saye it is the Deuill hym selfe, and so make reꝑoꝛt to other. Moꝛe then sixtene yeares ago, on May daye, when many younge folke went abꝛoade early in the moꝛnyng, I remember, by sixe of the clocke in the foꝛenoone, there was newes come to London, that the Deuill the same moꝛnynge, was sæne flyinge ouer the Temmes: afterward came woꝛde, that he lyghted at Stratfoꝛde, and ther was taken and sett in the stockes, and that though he would fayne haue dissembled the matter, by turning hym selfe into the likenes of a mã, yet was he knowẽ welinough by his clouen feet. I knowe some yet alyue, that went to sæ hym, & returning affirmed, that he was in dæd sæn flying in the ayꝛe, but was not taken pꝛysoner. I remember also that som wyshed he had bæn shot at with gons, oꝛ shaftes as he flewe ouer the Tẽmes. Thus do ignoꝛant men iudge of these thynges that they knowe not, as foꝛ this Deuill, I suppose it was a flyinge Dꝛagon, wherof we speake, very fearefull to loke vpon, as though he had life,

because

because he moueth, where as he is nothing els but cloudes & smoke, so mightie is God, that he cã feare his enemies, with these and suche lyke operations, whereof some examples may be founde in holy scripture.

¶ *Of the Pyramidall pyller lyke a spire or broched steeple.*

THis sharpe poynted piller, is generated in the hyghest region of the ayre, and after this sort. When the *Exhalatiõ* hath much earthly matter in it, the lighter partes and thinner (as their nature is) ascending vpwarde, the grosser, heauier, and thycker, abyde together in the bottome, and so is it of fashion great beneath, and small pointed aboue, and being set on fire it is so seen, and thereof hath his name. *Of spires.*

¶ *Of Fyre scattered in the ayre.*

FYre scattered in the ayre, or illuminations, are generated in the lowest region of the ayre, when very dry and whote *Exhalations*, are drawen vp and mæting with colde cloudes, are sent back agayne, which motions setteth thẽ a fyre, whose partes, being not equally thycke or ioyned together, seme as *Fyre scattered.*

though fyer were scattered in the ayre. Yea sometimes, the whole ayre seemeth to burne, as though it would raine fyre from heauen, & so it hath come to passe, burning both cities and townes. Then iudge, how easy it was for God to raine fire vpō Sodome and Gomor, for their sinnes and wickednes.

¶ *Of lights that goeth before men, and followeth thē abrode in the fields by the night season.*

Light that goeth before men and foloweth thē in the night.

THere is also a kind of light, ỳ is seen in the night season, & seemeth to goe before men, or to followe them, leading them out of their waye vnto waters, & other daungerous places It is also very often seen in the night, of thē that sayle in the Sea, & sometyme will cleaue to ỳ mast of the shyp, or other highe partes, somtyme slyde round about the shyppe, and either rest in one part till it go out, or els be quenched in the water. This impression seen on the lande, is called in latin, *Ignis fatuus*, fowlish fyre, that hurteth not, but only feareth foules. That whiche is seen on ỳ Sea, if it be but one, is named *Helena*, if it be twoo, it is called *Castor* and *Pollux*.

The foulishe fyre, is an *Exhalation* kendled

kendled by meanes of violent mouing, when by cold of the night, in the lowest region of the ayre, it is beaten downe, & then commonly, if it be light, sæketh to ascende vpward, & is sent down againe, so it danseth vp & downe. Els if it moue not vp and downe, it is a great lompe of glueyth or oyly matter, that by mouing of the heate in it selfe, is enflamed of it selfe, as moyst haye wyll be kyndled of it selfe. In whote and fenny countries, these lyghtes are often sæn, and where as is abondaunce of suche vnctuus and fat matter, as about churchyardes wher throughe the corruptiõ of the bodies ther buried, ỹ earth is ful of suche substance, wherfore in churchyardes, or places of cõmon buriall, oftentimes ar such lightes sæn, which ignorant & superstitious fooles, haue thought to be soules tormẽted in the fyre of purgatorie. In dede ỹ deuill hath vsed these lightes (although they be naturally caused) as strong delusions to captiue the myndes of men, vñ feare of the Popes purgatorie, wherby he did opẽ iniury to the bloud of Christ, which only purgeth vs frõ al our sinnes and deliuereth vs from al tormẽts, both

tempozall and eternal, accozding to the
saying of the wyse mā, the soules of the
ryghteous are in the hands of God, and
no tozment toucheth them. But to re-
turne to the lightes in whiche, there ar
yet twoo thinges to be considered. First,
why they leade men out of their waye.
And secondly, why they sæme to follow
men and go befoze thē. The cause why
they leade men out of the waye, is, that
mē whyle they take hede to such lights,
and are also soze afrayde, they fozgett
their waye, and then being ones but a
litle out of their waye, they wāder they
wote not whether, to waters, pyttes, &
other very daungerous places. Which,
when at lengthe they happe the waye
home, wyll tell a greate tale, how they
haue bēen lead about by a spirite in the
lykenes of fyze. Nowe the cause why
they sæme to goe befoze men, oz to fol-
lowe them, some men haue sayde to be
the mouing of the ayer by the goyng of
the man, which ayze moued, shold dziue
them fozward if they were befoze, and
dzawe them after, if they were behynd.
But this is no reason at all, that the fire
which is oftētimes, thze oz fowze miles

distaunt

distaunt from the man that walketh, shold be moued to and fro by that ayre which is moued through his walkinge, but rather the mouing of the ayre & the mans eyes, causeth the fyre to seme as though it moued, as the Mone to chyldren semeth, if they are before it, to run after them: if she be before them, to run before them, that they can not ouertake her, though she seme to be very neare them. Wherfore these lyghtes rather seme to moue, then that they be moued in deade.

¶ *Of Helena, Castor and Pollux.*

Helena, Castor, Pollux.

When the lyke substaunce in the lowest region of the ayre, ouer the Sea by the lyke occasion is set on fyre, if it be one onely, it is called *Helena*, if ther be two, they ar called *Castor* and *Pollux*. These impressiõs will oftentimes cleue to the maste & other partes of the ships, by reason of the clammynes and fatnes of the matter. *Helena* was of the Heathē men, taken as a Goddesse the daughter of *Iupiter* and *Leda*. *Castor* & *Pollux*, were her brethren. *Helena* was the occasion ỹ Troy was destroyed, therfore the Mariners by experience tryinge that one

flame of fyre apearyng alone, signified tempest at hād, supposed the same flame to be the goddesse *Helena*, of whom they looked for nothing but destruction. But when two lightes ar seen together, they ar a token of fayre wether, & good luck, the Mariners therfor beleued, that they were *Castor* and *Pollux*, whiche saylyng to seeke their syster *Helena*, beyng caried to Troye by *Paris*, were neuer seen after, and thought to be translated into ẏ nomber of the Gods that gyue good successe to them that sayle, as we reade in the last chapter of the Actes of the Apostles, that the shyppe wherein S. Paule sayled, had a badge of *Castor* and *Pollux*. A natural cause why thei may thus fore shewe either tēpest or calmnes, is this. One flame alone may geue warning of a tempest, because that as the matter thereof is compact, and not dissolued, so it is lyke, that the matter of tempeste (whiche neuer wanteth) as wynde and cloudes, is styll together, and not dissipated, then is it lyke not long after to aryse. By two flames together, may be gathered, that as this *Exhalation* whiche is very thycke is diuided, so the thycke

matter

matter of tẽpeſt is diſſolued & ſcactered abroade by the ſame cauſe that this is diuided. Therfore not without a reaſon, the Mariner to his mates may promyſe a proſperous courſe.

¶ *Of flames that apeare vpon the hearcs of men or beaſtes.*

THere is yet another kynde of fyry impreſſion, which is flames of fire vpon the hears of men and beaſtes, eſpecially horſes. Theſe are ſomtime clãmy *Exhalations*, ſcatered abroade in the ayre in ſmall partes, which in the night by reſiſtaunce of the colde, are kendled, cleauyng on horſes eares, on mens heades & ſhoulders that ryde or walke. In that they cleaue vpõ heares, it is by the ſame reaſon, that the dewe wyll be ſeen alſo vpon heares or garmentes, whoſe woll is hyghe, as fryeſe mantels and ſuche lyke. Another ſorte of theſe flames, are cauſed, when mens or beaſts bodies being chaffed, ſẽd forth a fat & clãmy ſwet, which is in like maner kidled as ỹ ſparkes of fire ỹ ar ſeen when a black horſe is curred. *Liuius* reporteth of *Seruius Tullius*, ỹ as he lay aſlepe, being a childe, his heare ſeemed to be all on a flame, which for all

Flames vpõ hears of men & beaſtes.

Liuius. Seruius Tullius.

for all that did not burne his heare, or hurt him. The lyke historie he reciteth of one *Marius*, a Knyght of Rome, that as he made an oration to his Souldiors in Spaine, they sawe his head burning on a lyght fyre, & he hym selfe not ware of it. Thus muche concerning these flames..

Marius.

¶ *Of Comets or blasing Starres.*

Comets or blasinge starres.

A *Comete* is an *Exhalation*, whote & dryc, of great quantitie, fat and clammye, harde compacte lyke a greate lompe of pitche, which by the heate of the sunne, is drawen out of the earth, into the hyghest region of the ayre, and there by ỹ excessiue heat of the place, is set on fire, apearing lyke a starre with a blasinge tayle, and sometyme is moued after the motion of the ayre, whiche is circuler, but it neuer goeth downe out of the cõpasse of syght, thought it be not seen in the daye tyme for the bryghtnes of the sunne, but styll burneth vntyll all the matter be consumed. An argument of ỹ greatnes is this, that there was neuer any *Comet* yet perceyued, but at the lest it endured seuen dayes, but much lõger they haue bene seen, namely fowrtye

dayes

dayes long, yea, lxxx. dayes, and some syxe moneths together. Wherfoze, it must neades be a wonderfull deale of matter, that can gyue so much nozyshement, foz so great and feruent fyze, and foz so long a tyme. There are consydered in a *Comet*, specially the colloz & fashion, which both aryse of the dispositiõ of the matter. Their collours, be either whyte, ruddye, oz blewe. If the matter be thynne, the collour is whyte. If it be meanly thycke, then is the *Comet* ruddy, after the collour of our fyze, but when the matter is very thycke, it is blewe, lyke the burning of Bzymstone. And as the matter is moze and lesse, after this disposition: so is the *Comet* of collour, moze oz lesse lyk to these thzée pzincipall collours, some yelowyshe, some duskish, some grenishe, some watchet &c.

In fashion ar noted thzée differẽces, foz eyther they séeme round, wt beames round about, oz with a beard hangyng dowward, oz els with a tayle stretched out sydelong, in lengthe. The first fashion, is when the matter is thickest in the myddest, and thinne rounde about ẏ edges. The seconde is, when the *Exha-*

lation

tion is vpwarde thicke, and in lengthe downewarde also, meanly thycke. The third forme is lyke the seconde, sauynge that the tayle hangeth not downe, but lyeth aslyde, & is cõmonly longer then ỹ beard. The tyme of their generation is oftenest in *Autumne* or harueſt. For in the ſpring, there is to muche moyſture, and to lytle heate, to gather a *Comet*. In ſommer, is to muche heate, whiche will diſperſe and conſume the matter, that it can not be ioyned together. As for wynter, it is cleane contrary to the nature if a *Comet*, which is whoat & dry e, wynter being cold and moiſt, therfore no tyme ſo meet as *Autumne*.

The temper of the 4. quarters.

Now for ſo muche as many learned men, haue gone about to declare the ſignification of blaſing ſtarres, we will omit nothing ỹ hath any ſhadowe of reaſon, but declare what is wrytten of thẽ.

The ſignification of Comets.

Such things as are ſet forth of ỹ betokening of *Comets*, ar of two ſortes: the firſt is of naturall, the ſecond of ciuile or politike effects. They ar ſayd to betokẽ drought, barynes of ỹ earth & peſtilence.

Drought, becauſe a *Comet* can not be generated without great heat, & muche moiſture

moisture is cõsumed in ỹ burning of it.

Barrines, because ỹ fatnes of ỹ earth, is drawẽ vp, wherof the *Comet* cõsisteth.

Pestilence, forsomuch as this kynd of *Exhalations*, corrupteth the ayre, which infecteth the bodies of men & beastes.

The second sort, might wel be omitted, sauing ỹ *Aristotle* him selfe, disdayneth not to seeke out causes for some of them. Generally it is noted of all Historiographers, that after the apearing of *Comets*, moste comenly followed, great & notable calamities. Beside this, they be token (sayth some) warres seditions, chãges of commẽ wealths and the death of Princes and noble men. *Arist.*

For what times *Comets* do shyne, ther be many whote & drie *Exhalations* in the aire, which in drie mẽ kindle heat, wherby they ar ỹoked to anger, of anger cõmeth brawling, of brawling fighting & war, of warre victory, of victory chaũge of cõmon welths. Then also Princes, liuing more delicatly thẽ other men, ar more subiect to infection, therfor dye sooner thẽ other mẽ. If it wer lawful to reason of this sort, we might enduce thẽ to betokẽ, not only these few things, but al other things ỹ chanse in the worlde.

Yet these predictions haue a shew of reason though it be nothing necessary: but it is a world to see, how the *Astrologians*, dote in suche deuises. They ar not ashamed, to an earthly substaunce, to ascribe an heauenly influence, and in order of iudgement to vse them as verye starres, suerly by as good reason as to the celestiall starres, they attribute diuine influences and effectes. But this their folly, hath been sufficiently detected by dyuerse godly and learned men, and this place requireth no longe discourse thereof. Wherfore this shall suffice, both for the naturall causes of blasyng starres, and also, for all flames in generall. It followeth therfore that with like breuitie we declare the causes of fyery aperitions.

¶ *Of Aparitions.*

Aparitions.

A *Aparition*, is an *Exhalation* in the lowest or hyghest region of the ayre, not verely burning, but by refraction of lyght, either of the sunne or the Mone, seemeth as though it burned. Whiche appearaunce of collour, ryseth not of the mixtiō of the fowre qualities, as it doth in bodies perfectly mixed, as herbes,

stones.

stones &c. But only of ỹ falling of light vpon shadowe. The light is in steade of whyte, and the shadowe or darkenes in steade of black. These diuersely mixed according to ỹ diuerse dispositiõ of ỹ *exhalation*, which ministreth varietie by thicknes or thynnes, cause diuerse collours.

There be commonly recited three kindes of fyery apparitions.

¶ *Collours, wyde gapinges, and deepe holes, whiche apeare in the cloudes.*

¶ *Of collours.*

COllours are heare ment, when there is nothing els to be noted, but the collours of the cloudes, and they are caused (as it is sayde) by casting the lyght into the shadowye cloude, accordyng as it exceadeth more or lesse in thicknes. whereof some be very bright whyte, and that is when the *Exhalation* is very thynne: some yealowish, when the *Exhalations* is thicker, somme ruddy, when it is meanly thicke, and very black when it is very thicke. The redd and ruddy collours are sæn, only in the mornyng and eueninge, when the lyght of the sunne is not in his full force, for at other tymes of the daye, his lyght is to vehement, cleare, strong,

Collours in the aire

strong, and pearsing. This much of colours. ¶ *Of wyde gaping.*

Wyde gapinge of cloudes in the ayre.

VVyde gaping is causeD, when an *Exhalation* is thick in the middest, & thinne on the edges, thē the light beig receiued into it, causeth it to appeare as though the skye did rende, & fire breake out of it. ¶ *Of round opening Hiatus.*

Roūdopening in the ayre.

THese holes called *Hiatus*, differ from wyde gapinges, in nothing, but that they be lesse, & therfore seme as though they were depe pittes, or holes, and not rending or gaping, and these be those apparitions, that apeare fyery and yet bee not so in deade. Therfore let this be sufficient to haue shewed the natural causes of all fiery *Meteores*.

The thirde Booke of aery impressions.

VNder ỹ name of aery impressiōs, be cōprehended, such *Meteores*, whose matter is most of the aire. Of this sort be windes, earthquakes, thōder, lightnigs stormewyndes, whirlewyndes, circles, raynbowes, ỹ white circle, called of som watlig strete, many sunes many mones

¶ *Of Wyndes.*

THe wynd is an *Exhalation* whote and drie, drawne vp into ẏ aire by ẏ power of ẏ sunne, & by reason of ẏ waygbt therof being driuen dolwn, is laterally or sideiongs caried about the earth, & this diffinition is to be vnderstãded, of generall wyndes, ẏ blowe ouer al ẏ earth, or ris som great regions, but beside these, there be particular wyndes, whiche are knolwen but only in som coũtries, & thẽ not very large, these wyndes oftẽtimes haue another maner of generatiõ. And that is on this maner. It must nædes be cõfessed, ẏ wĩn the globe of the earth, be wõderful great holes, caues, or dõgeõs, in which whẽ ayer abondeth (as it may by diuerse causes) this ayer, ẏ cannot abide to be pined in, findeth a litle hole in or about those countries, as it weare a mouth to break out of: & by this meanes, bloweth vehemẽtly, yet ẏ force & vehemens ertendeth not far, but as ẏ wynde that cõmeth forth of bellowes, neare the comming forthe, is stronge, but farre of, is not perceiued: So this particular wynd, in ẏ countrye, where it breaketh forth, is very violẽt & strong, in somuch, ẏ, it ouerthroweth both trees, & houses,

Wynde.

The second kinde of wyndes.

yet in other countries, not very farre distant, no part of that boisteous blast is felt. Wherfore this wynde differeth frō the generall wyndes, both in qualities & substaunce or matter, for the matter of them is an *Exhalation*, and the qualities suche as the nature of the *Exhalation* is, very ayery, but not ayere in deade: but of this particular wynde, the matter and substaunce is moste commonly ayer.

the thirde kynd of wynde.

There is yet a thyrde kynde of wynde, whiche is but a softe gentle and coole mouing of the ayre, and commeth from no certaine place (as the generall wynd doth) yea it is felt in the shadowe vnder trees, when in the whote lyght and shining of the sunne, it is not perceiued. It commeth whisking sodenly, very pleasaunt in the heate of the sommer, and ceaseth by and by. This properly is no wynde, but a mouing of the ayre by som occasion. As for the generall wyndes, thei blowe out of diuerse quarters of the ayre, nowe East, nowe West, nowe South, nowe North, or els inclininge to one of the same quarters. Amonge whiche the East wynde followyng the nature of the fyre, is whote and drie, the

South

Southwynde expressing the qualitie of the ayre, is whote and moyste, the Westerne blast, agreing with ẏ waters propertie is colde and moyst. The Northe that neuer was warmed with the heat of the sunne, being cold and drye, partaketh the conditions of the earth. The midle wyndes haue midle & mixed qualities after ẏ nature, of those fowre principall wyndes more or lesse, as they encline toward them more or lesse.

the qualities of the wyndes and the fow quarters of the worlde.

the qualitie of midle wyndes

Generally the profit of all wyndes, by the wonderfull wysdome of the eternall God, is wonderfull great, vnto his creatures. For besydes ẏ these wyndes, alter the weather, some of them bryngyng rayne, some drynes, some frost and snowe, whiche all are necessary, ther is yet an vniuersall comoditie, that ryseth by the only mouyng of the ayre. Which were it not continually styrred, as it is, would soone putrifie, and beyng putryfied, would be a deadly infection to all ẏ hath breath vpon the earth. Wherfore this wynde whose sounde we heare, and knowe not from whence it cōmeth nor whether it goeth (for who can affirme from whence it was raysed, or where it

the profit of wynde.

Ioan. 3.

is layde downe) as al other creatures beſyde doth teach vs, the wonderfull and wyſe prouidence of God, that we maye worthely crie out, with the Pſalmiſt, & ſaye: O Lorde, howe manyfolde are thy wordes, in wyſdome haſt thou made them all, &c. Let this be ſufficient, to haue ſhewed the generation of the wyndes.

Pſal. 104.

¶ *Of earthquakes.*

Earthquakes.

AN earthquake, is a ſhaking of ỹ earth whiche is cauſed by meanes of wynde and *Exhalations*, that be encloſed, within the caues of the earth, and can fynde no paſſage, to breake forthe, or els ſo narrowe a waye that it can not be ſone enoughe delyuered. Wherefore, with great force, and violẽce it breaketh out, and one whyle ſhaketh the earth, another whyle rendeth and cleaueth the ſame, ſometyme it caſteth vp the earth, a great heyght in to the ayre, and ſometyme it cauſeth ỹ ſame, to ſynke a great depth downe, ſwallowyng both cyties, and townes, yea and alſo mightie great moũtaignes, leauing in the place wher they ſtode, nothyng but great holes of an vnknowen depthe, or els great lakes of wa-

of waters.

¶ *Of diuerse kindes of earthquakes.*

Diuerse kyndes of earthquakes.

Dyuerse authors wryte dyuerselye, of the kindes of earthquakes, some makyng more and some lesse, but we shall be content at this tyme to comprehende them in fowre sortes.

The first kynde is when the earth is shaken laterally, to one syde, whiche is when the whole force of the wynde dryueth to one place, and there is no other contrary motion, to let it. This wynde if it be not great shaketh the earth, that it trembleth as a man that hath a fyt of an agewe, and dothe no more harme, but if it be great and violent, it louseth the foundations of all bydinges, be they neuer so stronge, and ouerthroweth whole cyties, but specially ỹ great buildynges, and not onely buyldinges, but some tyme also casteth downe greate hylles, that couer and ouerwhelme, all the valley vnder them. Many noble and great cities, haue bẽn ouerthrowen by this kynde of earthquake. It is wrytten that twelue of the moste bewtifull cyties, and moste sumptuous buildyngs in all *Asia*, were ouerthrowne and vtterly

Twelue cities ouerthrowen with one earthquake.

destroyed with any earthquake. Howe often, *Antiochia*, yea within short tyme, was destroyed, they whiche haue redde the histories, can testifie. Howe terrible was the earthquake, that shoke *Constantinople* a whole yeare together, that the Emperour, & all the people, were faine to dwell abroade in the fieldes, vnder tentes & pauilions for feare their houses would fall on their heade, it is recorded in Chronicles, & worthy to be remembred.

Constantinople the chiefest cittie of Grece now the Turkes pallace.

The secõd kynde.

The seconde kynde is, when ỹ earth with great violence is lifted vp, so that the buyldinges are lyke to falle, and by and by synketh downe agayne: this is when all the force of the wyndes stryueth to get vpwarde, after the nature of gonpouder, and fyndyng some waye to be delyuered out of bondage, the earth that was hoysed vp, returneth to his old place.

The thyrd kynde.

The third kynde is a gapinge, rendyng, or cleauing of the earth, when the earth synketh downe, and swalloweth vp cities, and townes, with castels, and towers, hylles and rockes, ryuers, and floodes, so that they be neuer seen again.

Earthquake on the sea.

Yea the Sea in some places hath been

dronke

dronke vp, so that mē myght haue gone ouer on foote, vntyll the tyme of tyde or flood returning, couered the place with waters againe. But in the lande, where this earthquake swalloweth vp any cytie, or countrie, there apeareth nothing in the place thereof, but a marueylous wyde and deape goulf, or hole. *Aristotle* maketh mention of diuers places, and regions that were ouerthrowen with this kynde of earthquake. *Aristot.*

The fourth kynde, is when greate mountaynes ar cast vp out of the earth, or els when some part of the lande synketh downe, and in steade thereof aryse ryuers, lakes, or fyers, breakyng out w̄ smoke and ashes. It causeth also ouerflowyngs of the sea, when the sea bottom, is lyfted vp, and by this meanes, arise many Ilandes in the sea, that neuer were seen before. These and other suche miracles, are often to be founde in the wryters of histories, also in the *Philosophers*, as *Aristotle*, *Seneca*, and *Plinius*. *The fourth kynde.* *Newe Ilandes in the sea.* *Aristi.*

Neuertheles, the effectes of some, as moste notable it shall not be vnprofitable to recite. *Plato* in his *Dialogue*, intituled *Timeus*, maketh mention by the way *Seneca.* *Plinius.* *Plato.*

A wōder full earth quake.
Africa.
Europa.
Asia the three parts of the erth
Mare mediterraneum becau se it goeth through the midst of the earth.
Atlātis. an Iland.
Seneca.
Theron & Therea.
Arist.
Hero o- tus.
Egipt some time a golphe of the sea.

of a wonderfull earthquake, wherebyd not only *Africa* was rent asonder from *Europa* and *Asia* (as it is indead at this daye, except a lytle necke by the redde Sea,) the Sea entring betwene them that nowe is called *Mare mediterraneum*: But also a wonderfull great Ilande, whiche he affirmeth, was greater then *Aphrica* and *Asia* both, called *Atlantis*, was swallowed vp, and couered by the waters, in so muche, that on the Sea called *Atlanticum*, for a great whyle after, no shippe could sayle, by reason that the same huge sea, by resolution of the earth of that myghty Iland, was al turned into mudde. The famous Ile of *Scicilia* was also some tyme a part of *Italy*, and by earthquake rent asonder from it. *Seneca* maketh mentiō of two Ilandes. *Theron* and *Therea*, that in his tyme, first apeared. It should seeme both by *Aristotle*, and also by *Herodotus*, that *Egypt*, in aunciēt tyme, was a goulphe of the sea, and by earthquake made a dry lande. During the raygne of *Tyberius* the Emperour, twelue notable cyties of *Asia*, were ouerthrowen in one nyght, &c.

Howe

¶ *How so great wyndes come to be vnder the earth.*

The great caues and dennes of the earth, muſt neades be full of ayere continually, but when by the heate of the ſonne, the moyſture of the earthe is reſolued, many *Exhalations* ar generate as well within the earth, as without, & where as the places were full before, ſo that they coulde receyue no more erepte part of that which was in them nor lett out, in ſuche countries, where the earth hath fewe pores, or els where they bee ſtopped, with moyſture, it muſt neades followe, that theſe erhalations ſtriuing to get out, muſt neades rende the earth in ſome place, or lifte it vp, ſo that either thei may haue free paſſage, or els rowm inough to abide in.

¶ *Of the ſignes and tokens that goe before an earthquake moſt commonly.*

The firſt is the raging of the ſea, whē there are no tempeſtuous wyndes, to ſtyre it, yea when the ayre is moſte calme without wyndes. The cauſe why the Sea then rageth, is that the wynde beginneth to labour for paſſage, *The ſignes of an earthquake.*

that

that waye, and fynding none, is sent back, and sone after shaketh the lande. The seconde sygne is calmenes of the ayre, and colde, whiche cometh to passe by reason that the *Exhalation*, that shold be abroade, is within the earth.

The thirde signe, is sayde to be, a longe thine strake of a cloude seen, whē the skye is cleare, after the setting of the sonne. This (saye they) is caused, by reason that the *Exhalation* or vapor, whiche is the matter of cloudes, is gone into ȳ earth Other affirme that it is the *Exhalation* that breaketh out of som narrowe hole of the earth, out of whithe the rest of the wynds cannot issue, neither will it wayghte the tyme, wherfore within a while after, it seeketh and maketh it selfe by soden eruption a broader ways to be deliuered out of prison.

Also the sunne certaine dayes before it, appeareth dimme, because the wynd, that should haue purged and dissolued ȳ grosse ayere, that causeth this dymnes, to our eyes, is enclosed within the bowels of the earth.

The water in the botome of deape welles, is troubled, and the sauor therof

infec-

infected, because the pestilēt *Exhalations* ẏ haue ben long inclosed, within ẏ earth do thē beginne a litle to be sent abroade. For thereof cometh it, that in many places where earthquakes haue bēn, great aboundaunce of smoke, flame, & ashes, is cast out, when the aboundaunce of brymstone that is vnder the grounde, through violent motion is set on fyre, & breaketh forth. Finally, who knoweth not, what stynking mynerals and other poysonous stuffe doth growe vnder the earth? wherfor it is no wōder if well water, before an earthquake, be infected, but rather it is to be marueiled, if after an earthquake, there followe not a greuous pestilence, when the whole masse of infection is blowne abroade.

Last of all, there is harde before it, in the tyme of it, & after it, a great noyse and sounde vnder the earth, a terrible groanyng, and a verye thondryng, yea somtymes when there followeth no earthquake at all, when as the wynde without shaking of the earth, fyndeth a waye to passe out at. And these for the moste part, or at lest some of them, are forewarninges that the moste fearfull earth-

Thōdring vnder the earth.

earthquake wil followe, then the which there is no natural thing, that bryngeth men into a greater fear. *Cato* was very curius to confesse him self, that he repented, that euer he went by water, where as he might haue gone by lande. But what lande, can be sure? if it be the Lordes will, by this worke of his to shake it? what building so strong ẏ can defende vs? when the more stronge the more danger, the higher ẏ greater fall.

Cato.

¶ *Of thonder.*

Thonder. THõder is a sound, caused in ẏ cloudes by the breaking out of a whote & dry *Exhalation*, beating against the edges, of the cloude. It is often herde in spryng & sommer, by reason ẏ the heat of ẏ sonne, thẽ draweth vp many *Exhalations*, which meating in the midle regiõ of the ayre, wt colde & moist *vapors*, ar together with them, inclosed in an hollowe cloud, but whẽ the whot *Exhalatiõ* cannot agree wt the coldnes of ẏ place, by this strife being driuen together, made stronger and kẽdled, it wil neades breake out which soden & violent eruptiõ, causeth ẏ noyse which we cal thõder. A similitude is put by gret autors of moist wood, ẏ cracketh in the

a similitude.

in ỹ fire, we may adde here vnto ỹ breaking of an egge in the fire, of an apple, or any like thing, for whatsoeuer holdeth & withholdeth, enclosed any whot wind, so ỹ it can haue no vente, it wil seeke it self a way, by breaking ỹ skinn, shell or case. It wer no ill cõparisõ to likẽ thõder to the sound of a gonne, which be both caused of the same or very like causes.

The soũd of thõders is diuerse, after which, men haue diuided ỹ thõders into diuerse kindes. Making first ỹ. sortes, ỹ is, small thõder & great. But as for the diuersitie of soũdes, generally it cõmeth of ỹ diuerse disposition of ỹ cloudes, one while hauing more holes then at another, somtime thicker in one place then in another. The smal or litle thõder is, when ỹ *exhalatiõ* is driuẽ frõ side to side, of ỹ cloude, making a noise, & ether for ỹ smal quãtitie, & lesse forcibles, or els for the thicknes of ỹ cloudes walles, is not able to break thẽ, but rõbleth vp & down wiñ ỹ cloud, whose sids ar strõger thẽ ỹ force of ỹ *exhalation* is able to breake, it rõneth vp & down wiñ, & striking againſt the cloud & moist sides, maketh a noyse not vnlike to the quẽching of whote yrõ in cold water.

Diuerse kindes of thonder.

Smal thonder and the kindes therof

And

And if ỹ *Exhalation* be meanly ſtrõg, and the cloude not in all places of lyke thickenes, it breaketh out at thoſe thinn places whiche ſuche a buſſing, as wynd maketh blowyng out of narrow holes.

But if the cloude, be ſo thynne, that it cannot kepe in ỹ *Exhalation*, although it be not kyndled, then it bloweth out with lyke puffinge as wynde commeth out of a payre of bellowes.

Great thõder and thekindes therof.

A great thonder, is when the *Exhalation* is muche in quantitie, and verye whote and dryе in qualitie, the cloude alſo very thycke and ſtronge, that eaſely wyll not geue place to the wynde, to eſcape out.

Wherfore if the *Exhalation* do vehemently ſhake the cloude, though it doe not at the firſt diſperſe it, it maketh a longe and fearefull romblyng againſt the ſydes of the cloude, vntill at the laſt being made ſtronger by ſwyfter motiõ, it diſſolueth the cloude, and hath lybertie to paſſe out into the open ayer. The cloude reſolued, droppeth downe, and then followeth a ſhowre of rayne.

Otherwhyles it ſhaketh the cloude, not long, but ſtreyghtwaye rendeth it a

long

long space of tyme, whose sounde is like the rendyng of a broade clothe, whiche noyce continueth a prety whyle.

And sometime it discusseth the cloude at once, makyng a vehement and terryble cracke lyke a gonne, sometime with great force, casting out stones, but most commenly fyre, whiche setteth manye highe places on fyre. As in the yeare of our Lorde, 1561. the fourth day of *June*, the steple of saint Paules church in Lõdon was set on fyre, as it hath bẽen once or twyse before, and burned. The noyce of thonder though it be great in suche places ouer whiche it is made, yet is it not harde farre of, especially against the wynde. Whereof we had experience also in the yeare of our Lorde, 1561. on saynt Mathyes daye in *February*, at the euening, when there was a great flashe of lyghtnynges, and a verye terryble crack of thonder followynge, they that were but xv. myles from Londõ Westwarde, hearde no noyse, nor sound therof the wynde that tyme was Westerne. *How farr thũder is harde.*

The effect of thonder is profitable to men, bothe for that the swete shower doth followe it, and also for that it pur- *The profit of thonder.*

geth, and purifieth the ayre by the swyft mouynge of the *Exhalation*, that breaketh forthe, as also by the sounde which deuidynge and pearcyng the ayre, causeth it to be muche thynner, which may be veryfied by all historie that *Plutarchus* in the life of *T. Quincius Flaminius*, reporteth, that there was suche a noyce made by the *Grecians* after theyr lybertie was restored, that the byrdes of the ayer that flewe ouer them were seen to fall downe, by reason that the ayer deuided by theyr cryc, was made so thinn, that there was no firmitie, or strengthe in it to beare them vp. And let this suffice for thonder, whome lyghtnyng succeadeth in treatie, that seildome is from it in nature.

Plutarch° T. Quincius Flaminius.

¶ *Of Lyghtninge.*

Lightnig Among the diuerse kindes of lightning, whiche writers in this knowledge doe nomber, we shall entreate onely of fowre kyndes, yet so, that vnder these fowre, all the reste maye be comprehended. The names we must borrowe of the latin tongue. The first is *Fulgetrum*, The seconde *Coruscatio*, the thyrd *Fulgur* the fourth, *Fulmen*.

Fulgetiũ, Coruscatio, Fulgur, Fulmen.

Of

¶ *Of Fulgetrum.*

Fulgetrum we cal that kynde of lyghte- *Fulgetrū*
ning which is seen on sommer nights and eueninges, after a whote daie. The generation hereof is suche, when many thynn, light, and whote *Exhalations*, by the immoderate heate, haue ben drawen vp from the earth, and by the absence of the sunne, be destitute of ỹ force, wherby they should haue bẽn drawen further vpwarde, yet somethinge ascending by their owne nature, in that they be lyght and whote they meat with the colde, either of the night in the lowest region, or els of the ayre in the midle region, & so by resistence of cõtraries (as it hath bẽn oft before rehersed) they ar beaten back, and with the vehement mouing set on fire. This lightning commonly goeth out in the ayre, terrible to beholde, not hurtful to any thig. Except somtim whẽ the matter of it is, earthy & grosse, being striken downe to the earth, it blasteth corne, and grasse, with other small hurt. Sometyme it setteth a barne or thacked house on fyere. The collour of this lightninge, as of all other, is dyuers, *The collor of this lyghtning.*

partly accoꝛding to the matter, & partly accoꝛdyng to the lyght. If the matter be thynne, it is whyte, if the substaunce be grosse, it is ruddy, lyke flames of fire, in great light as in the daie it appeareth whyte, in the nyght, ruddy, yet somtime in the daye tyme, we may see it yealow, whiche is a token that the matter is wōderfull thicke and grosse. Olde wyues are, wont to saye that no nyghte in the yeare, except one passeth without lyghtnynge, but that is as true as the rest of theyr tales, whereof they haue greate stoꝛe.

¶ *Of Coruscation.*

Coruscation.

Coruscation is a glistering of fyre, rather then fyre in deade, and a glymmerynge of lyghtning, rather then lightning it self. which is ye maner of wayes, one waye, whē cloudes ye be lower then the vpper part of the earth, without the compasse of our syght, are enflamed, & the reflexion of that flame, is cast vp into our syght appearyng in all poyntes lyke lyghtning, sauinge that the ayer where it appeareth is so cleare, that we are perswaded no lightning can be ther caused. Another waye, is when there be thycke cloudes ouer vs, and commonlye a double

a double order of cloudes, one aboue an other, if lightninge or any other inflammatiõ be in ỹ vpper part of these clouds, the lyght of them perceth through the lower partes, as through a glasse, and so appeareth as though it lyghtned, when perhappes it did lyghten in deade, yet that whiche we sawe, was but the shadowe therof. And this is often without thonder.

¶ Of *Fulgur*.

Fulgur.

FVlgur is that kynd of lightning which followeth thonder, whereof we haue spoken before. For when that violent *Exhalation* breaketh forthe, makynge a noyce as it beateth against the sydes of the cloude, with the same violence, it is set on fyre, and casteth a great lyghte, whiche is seen, farre and neare. And although the lyghtnyng appeare vnto vs, a good preaty whyle before the thonderclappe be harde, yet is it not caused before the noyce if any thonder at all doe followe, but eyther is after it or with it. Wherfore that we see it, before we hear the thõder, may be ascribed, either to the quicknes of our syght, that preuenteth ỹ hearing, or els to the swyft mouinge of

The lightening is not before the thond. though it seeme so.

the fyer and the lyght thereof, to oure eyes, and the slow mouynge of the soūd vnto our eares and hearynge. These thrée kyndes of lyghtnynges, are more feareful then hurteful, but the fourth seldome passeth wout som damage doing.

Sight preuenteth hearing.

¶ *Of the fourth kynde called Fulmen.*

THe moste dangerus, violent, & hurtfull, kinde of lightning is called *Fulmen*, whose generation is suche, as followeth. What tyme, a whote *Exhalation*, is enclosed in a cloude, and breakynge the same, bursteth forth, it is set on fyre, and with wonderfull greate force stryken downe toward the earthe: The cracke of thonder, that is made when this lyghtenynge breaketh out, is sodayne, shorte, and greate, lyke the sounde of a gonne. And often tymes a greate stone is blowne out, with it, which they call the thonder bolt, which is made on this manner. In the *Exhalation*, whiche is gathered out of the earthe, is muche earthy matter, with clotterynge together by moysture, beyng clammy by nature, consistynge of brymstone and other metallycke substance,

The thonderbolt caste out of the cloudes.

stance, by the excessiue heate, is hardened as a brycke is in the fyere, and with the myghtye force of the *Exhalation*, stronglye cast towarde the earthe, and stryketh downe steples, and hyghe buildynges of stone, and of woodde, passeth through them and setteth them on fire, it cleueth trées and setteth them on fire, and the stronger the thynge be that resisteth it, the more harme it dothe to it. It is sharpe poynted at one ende, and thycke at the other ende, whiche is caused by reason, that the moyster part, as heauyer, goeth to the bottome of it. So is the toppe smal, and the bottom thick.

Strongest things are most hurt of lightenyng.

When wryte that the thonderbolt goeth neuer aboue fiue fote deepe, whē it falleth vpon the earth, whiche standeth with reason, both because the strengthe of it is weakened, before it com so neare the ground, and also, because the continual thicknes of the earth, breaketh the force, were it neuer so great.

How depe thōderbolt goeth into the earth.

Both *Aristotle*, *Seneca* and *Plinius*, deuide this lyghtning into thrée kyndes.

Aristot.
Plinius.
Seneca.

¶ *Of the fyrst.*

The first is drye, whiche burneth not, to be felte but deuideth, and perceth

Drie lightening.

with wonderfull swyftnes. For beinge subtyle and pure, it passeth through the pores of anye thynge, be they neuer so small, and suche thynges, as giue place vnto it, it hurteth not, but suche thyngs as resisteth, it deuideth and perseth. For it wyll melt mony in mens purses, the purses being whole, & vnharmed. Yea, it wyl melte a swerde in the scabberde, and not hurt the scabberd at al. A wyne vessell it wyll cleaue, and yet the wyne shalbe so dull, that by the space of three dayes it wyll not ronne out. It wil hurt a mans hande and not his gloue. It wil burne a mans bones within hym to ashes, and yet his skynne and flesshe shall appeare fayre, as though nothinge had commen to hym. Yea otherwhyle the whole man in the moment of an howre, shalbe burned to ashes, where as his clothes, shal not seeme to haue been touched. It wyll also kyll the chylde in the mothers belly, & not hurte the mother. And all because the mater is very subtyle, and thinne, burnyng, and passinge through whatsoeuer it be, that wyll not graue it free passage.

Mony molten in mēs purses & swerds in scabbeds

¶ *Of the seconde kinde.*

The

THe seconde kynde is moyste, and because it is very thinne, it burneth not to ashes, but only blasteth, or scorcheth trees, corne, and grasse: and by reason of the moistnes, it maketh all thynges black, that it commeth neare, as moyste wood burning, is smokye and maketh thynges neare it to be blacke & smokie. *Moist lightninge.* *Why it maketh black.*

¶ *Of the thirde kinde.*

THe thirde kynde is moste lyke oure commen fyre, that we haue here on the earth of grosse and earthly substãce, wherfore it leaueth a pryntе where it hath bẽn, or els consumeth it into ashes, if it be suche a body as wylbe burned with fyre. *Grosse lightning.*

¶ *Of the marueyls of Lightening and their cause.*

BEside the wonderful effectes of lightnyng that haue been already remembred, there be many other whiche hereafter ensue, with the reason and causes vnto them belonging, as thus. *The marueiles of lightning*

THe nature of lyghtning is, to poyson beastes that are stryken therewith, as though they had bẽn bytten by a serpent. The cause of this is, that the matter of lightnyng, is muche infected with *Light poysoneth.*

brymstone, and other poysonous metal-like substances, whiche will poyson the rather in lightening, because it is thinne & geueth thē passage into euery part of the body. It is notable, that *Seneca* writeth, howe wyne vessels of wood beinge burned with lightning, the wyne wold stande styll, and not runne out, the reason hereof, is the swyfte alteration and chaunge, wherby also, all the clammynes of the wyne, is drawen to the outward moste part, and so kéepeth in the wyne, as in a skynne, that by the space of thrée dayes, it wyll not ronne. It wyl also poyson wyne, in so muche that they whiche drynke thereof, shall eyther be madde or dye of it. The cause hereof was set forth before.

Seneca.

Wyne not ronning the vessels being broken.

Lightnīg purgeth a poysonous beast.

Lightning that striketh a poysenous beaste purgeth it from the poyson, in so muche that it causeth a serpent or snake whiche it kylleth, to breade wormes, whiche otherwyse it would not doe, but beyng purged from the naturall poyson by the swyfte percyng of the lightning: nothyng letteth, but that it may breade wormes, as all other corrupte flesche wyll doe.

A snake breadeth no worms.

If light-

If lyghtning strike one that slepeth, it openeth his eyes, and of one that waketh, it shytteth the eyes. The cause is this, that it waketh hym that slæpeth, and kylleth hym before he can close his eyes agayne. And hym that waketh, it so amaseth, that he wynketh, as he wyll doe at any sodayne chaunse, so he dyeth before he can open his eies agayne.

Lightnig openeth his eyes that slepeth & closeth his that waketh.

All lyuynge thynges, turne their face towarde the stroke of the lyghtenyng, because it is their nature, to turne their head if any thig com sodēly behind them. The reste that haue theyr face toward it, when it commeth, neuer turne before they be kylled.

Lyuinge thinges turn their face towarde lyghtening.

The reason why it kylleth the child in the mothers wombe, not hurtynge the mother, is the tendernes of the one, and the strengthe of the other, when the lightenyng is not vehement, otherwyse both should dye together.

Sometyme lyghtening burneth only the garmentes, shoes, or heare of mē, not hurtynge theyr bodyes, and then the *Exhalation* is nothyng vehement. Some time it kylleth a man & there apereth no

Garments burnt the body vnhurt.

wounde

wounde without, neyther anye hurte within, no not so muche as any signe of burnyng: for then the *Exhalation* whiche being kindled is called lyghtning is wōderfull subtill and thinne, so swiftly passing through that it leaueth no marke or token behinde it.

Lightning causeth blindnes swelling or leprosy

They that beholde the lightening, are either made blynd, or their face swelleth, or els become lepers, for that fyery *Exhalation*, receiued into the pores of their face and eyes, maketh their face to swel, and breake out into a leprosie, and also drieth vp the Christalline humor of their eyes, so that consequētly they muste nēedes be blynde.

Eutropius.

M. Tullius Cicero.

Apulia.

Eutropius sheweth, that the same day in whiche *Marcus Tullius Cicero*, was borne, a certeine virgine of *Rome* ryding into *Apulia*, was striken with lightening, so that all her garmentes beinge taken from her without any rendinge, she laye starke naked, the lasing of her brest being vndone, & her hose garters vntied: yea, her bracelettes collers and rynges, being also losed from her. Lykewyse her horse laye dead with his bridle and girtes vntied.

The

The places of them that are burnt with lightning are colder then the reste of their bodies, other because the greater heat drawethe away the lesser, or els because, that by the great violence the vitall heate is quyghte extinguished in that place.

The wonders of lightning cold

The sea Calfe is neuer hurt with lyghtening, wherfore the Emperoures tentes, were wonte to be couered with their skinnes.

Sea calfe not hurt with lightening.

The Baye trees, and bore trees, are neuer or seldom strykē with lyghtning. The cause of these may be, the hardnes of their skinne, which hath so fewe pore holes, that the *Exhalation* can not enter into them.

Bayes & boxe seldom hurt with lightning.

The eagle also among fowles is not stryken with lightening, wherfore the *Poetes* fayne, that the Eagle carieth *Iupiters* armur, whiche is lightnyng. The reason may be the thicknes and drienes of her fethers, whiche wyll not be kindled with so swift a fyre.

The Eagle Iupiters harnesbearer

¶ *Of storme wyndes.*

A Storme wynde, is a thycke *Exhalatiō* violently moued out of a cloude without inflammation or burning. The matter of

Storme wyndes.

ter of this storme, is all one with ye matter of lightening, that hath béen spoken of: namely it is an *Exhalation* very whot and drye, and also grosse and thycke, so that it wyll easely be set on fyre, but thē it hath another name, & other effectes

The forme or maner of the generation is suche. When abondance of that kynde of *Exhalation* is gathered together, within a cloude, whiche nedes wyl haue one waye out or other: it breaketh the cloude, & causeth thonder, as it hath béen tought before, but if the matter be very thicke, and the cloude somewhat thynne, then doth it not rēde the cloude, but fallynge downe, beareth the cloude before it, and so is caried as an arrowe out of a bowe. It doth alwayes goe before a great soden showere, for when the cloude is broken, the water muste néedes fall downe. Also it is so grosse, and so thicke, that it darkeneth the ayre, and maketh all the lowest region of the ayre, to be in manner as a darke smokye cloude. It causeth tempeste in the Sea, and wonderfull great daunger to them that beare sayle, whome if it ouer-

take

take, it bryngeth to vtter destruction. So soden it is, that it can not be resisted wyth sodeyn helpe. So violent it is, that feble force canne not withstande it. Finally, it is so troublesome wyth thonder, lyghtnynge, rayne and blaste, besydes these darkenesse and colde, that it woulde make menne, at so neare a pynche to bee at their wyttes endes, yt they weare not accustomed to suche tumultuous tempest. Wherfore it weare profitable, to declare the signes that go before it, to the ende, menne myght beware of it. But they are so commen to other tempestes, that either they are knowen well enoughe, or els beynge neuer so well knowen, in a seldome calamytie they woulde lytle bee feared. The Sea shyppes subiecte to more danger, haue more helpe if it bee vsed in tyme, but no signes foreknowen, can profit the dweller of the lande, to keepe his house from ruine, except it weare to saue his lyfe from the fall of his mansion. The soden violence of this tempest to hym, is more seldom tymes, but more incurable when it commeth then to the Mariyner, who hathe some ayde to loke

to lowke for, by his comming, the other if he escape with his lyfe, may comforte hym selfe, that he was neare a greate daunger, & cast with hym selfe to builde vp his house agayne.

Of whyrle wyndes.

Whirle wyndes.

A Whirlewinde, is a wynde breaking out of a cloude, rowling or wynding round about, ouerthrowyng that which standeth neare it, and that whiche commeth before it, carying it with him a lofte in the ayre.

It differeth from a storme wynde in thre pointes.

First in the matter whiche is lesse in quantitie, and of thinner substaunce.

Secondly in the mouing, whiche is circulare wyndyng about, where as the storme bloweth a slope and sydelonges. Also a whyrlewynde in the mouinge diuideth not it selfe abroade, and bloweth dyrectly as the storme doth.

And thirdly in the maner of the generatiõ, for a storme doth alwayes come out of one cloude, but a whyrlewynde some tyme is caused by meanes of two contrary wyndes that meete together. In lyke maner, as we se in the streates

of cl-

of cyties, where the wynde is beaten back from two walles, mætinge in the myddest of the streate, there is made a lytle whyrlewynde, which whiskynge round about taketh vp the dust, or strawes and bloweth it about after the very similitude of the great & feareful whirle wynde. The reason of the going about, is this, that when the walles beat back the wynde from them, whiche aboundeth in that place, and those wyndes, whē they mēete by reason of equal force on bothe sydes, can neyther driue one ỹ other back agayn, nor yet passe through one ỹ other: it must nēedes be, that they must bothe seeke a waye on the syde at once, and consequently, be caried round about, the one as it were pursuing the other, vntyll there be space enough in the ayre, ỹ they may be parted asonder.

The matter of a whyrlewynde, is not muche differing from the matter of storme and lyghtening, that is an *Exhalation* whote and drye, breakyng out of a cloude, in diuerse partes of it, which causeth the blowyng about. also it is caused as it hath bēen sayde, by two or mors wyndes, blowyng from diuerse places,

The troubles of whirlewyndes.

whiche may be of particular causes ẏ hath been sheweth before in the chapter of wyndes. This tempest is noysome to man and beaste, Sea and lande, thyngs lyuing, and life lacking. For it wyl take vp bothe men and beastes, stones and cloddes of earth, whiche when it hath borne a great waye wyll not be so curtues as to sette them downe agayne, butneglygently letteth them fall from a great heyght, or els violently throweth them downe to the earth.

It breaketh trees wyndyng them about and pulling them vp by the rootes. It turneth about a shippe and brooseth it in peaces wͤ other mischiefes beside.

¶ *Of the fyred whirle wynde.*

Fyered whyrlewynde.

SOmetyme a whirlewynde, is sett on fyre within the cloude, and then breakyng foorthe, flyeth rounde lyke a great cartewhyle, terrible to beholde, burnynge and ouerthrowynge all drye thinges, that it commeth neare, as houses, woodes, corne, grasse, and whatsoeuer els standeth in the waye.

It differeth not from a whirlewind, sauing that it is kindled & set on fyre, so apearing, els the generation of both is called

called one. ¶ *Of Circles.*

THe Circle called *Halon*, is a garland of diuerse cõllours that is sæn about the sunne, the Mone, or any other sterre specially about *Iupiter* or *Venus*, for their greate bryghtnes. It is called of the Greeks a compassed platte, of the Latines a crowne or garlande.

Circles about the sunne, the moone & other sters Iupiter & Venus Planetes.

The matter wherin it is made, is a cloude of equall thicknes, or thinnes, cõming directly vnder ẏ body of the sunn, the Mone, or other sterres, into whiche the lyght of the heauenly body is receyued, and so appeareth rounde, because the sterre is rounde, or as a stone caste into the water, maketh many round circles, dilatyng in breadth, vntyll the violence of the mouyng is ended: so is it in the ayre the lyght beames percynge it, causeth broade Circles to be delated, whiche appeare whyght, purple, black, redde, græne, blewe, and other collors, accordyng to the disposition of ẏ cloudes mater. The cause of suche collours, is shewed before in the peculiar treatie of collours.

Circles in the water

The collours of circles.

This circle is oftener sæn about the Mone, then about the Sunne, because

the heate of the Sunne draweth the *vapors* to hyghe, where it can not be made. Also, because the nyght is a more quiet tyme then the daye from wynde, it is more often in the nyght, thē in the daye. Seldome about other sterres, because their lyght beams ar to weake often to perse a cloud, yet oftner about smal sters then the Sunne, because the lyght of ȳ Sunne, perceth the cloude more forcibely, then that this *Halon* can many tymes be cause.

Circles about a cādle.

Otherwhyles it is seen about a candell, which must be in a very thicke and grosse ayre, of suche proportionate thicknes, that it may receiue the lyght as the cloude doth frō the sterres, as in smoky places, or whotehouses.

This kynde of Circle, is sometimes lyke a raynbowe, sauynge that it is a whole circle, vnlesse the sterre vnder whiche it is caused, be not all rysen, or els the cloude in whiche it is seen be not al come vnder the sterre, or after it hath come vnder some parte thereof be dissolued from the rest.

the signes of these circles.

These Circles be signes of tempest, and wyndes, as wytnesse bothe *Virgile*, and

and *Aratus*. *Virgilius Aratus. Poetes.*

The wynde shall blowe from that quarter, where the circle first beginneth to breake. The cause whereof is this, that the circle is broken, by the wynde that is aboue, whiche is not yet come downe towardes vs, but by this effecte aboue, we may gather both that it wyll come, and also from what quarter.

A great Circle about the Moone, betokeneth great colde and frost to follow after. *Signe of frost.*

But if it vanyshe awaye and be dissolued altogether, it is a signe of fayre weather. *Signe of fayreweather.*

If it be broken in many partes, it signifieth tempest. *Signe of tempest.*

If it war altogether thicker, & darker it is a fore warnyng of rayne. *Signe of rayne.*

One alone after *Ptolomee*, pure and whyte, vanyshing away by lytle & litle, is a token of fayre weather. *Ptolomeo. Signe of fayre eather.*

Two or three at once, portendeth tempest, if they be ruddy, they shewe wynde to come, and toward snowe, they seeme as it were broken and rockye.

Being darke or dymme, they signifie all these forsayde euentes, with more *Signe of snowe.*

force and abundaunce, it is oftener caused in *Autumne*, and spring then in wynter or sommer, the cause is the temperatnes of the tyme.

The cause why it apeareth somtime greater, and sometyme lesser, is in the qualititie of the matter, whiche as it is grosse, or thynne, wyll more or lesse be dylated, and stretched abroade, and also as some wil haue it, of the weakenes of mens syght. Of whiche *Aristotle* bryngeth an example in one *Antipho*, whiche dyd allwayes see his owne image before hym in the ayre, as in a glasse, whiche he affyrmeth to haue bẽn for the weakenes of his syght beames, that coulde not pearce the ayre, so that they weare reflected agayne to hym selfe.

Aristot.
Antipho.

And thus muche for *Halone* and the causes, signes, or tokens of it.

¶ *Of the Raynbowe.*

Rainbow

THe Raynbowe, is the aparition of certain collours in a cloude opposite against the sunne, in fashion of halfe a Circle. *Possidonius* sayde, it was the sunnes lokyng glasse, wherein his image was representied, and that the bleiwe

Possidonius.

coloured

colloured, was the proper collour of the cloude, the redde of the sunne, all the other collours of commixtion.

It differeth manifoldly from *Halone*, for the raynbowe is alwayes opposite against the sunne, but *Halone* is directly vnder it.

They differ not onely in place, but also in fashion, the raynbowe, is but halfe a Circle, the *Halon* is a whole Cycle.

Lykewyse they vary in colloure, for the raynebowe is more dymme and of purple collour, the *Halone* whyter and bryghter.

Also in continuaunce, for the raynebowe may cõtinue, longer, then *Halone*.

The image of the raynbowe may be seen on a walle, ỹ sunn striking through a fire pointed stone, called *Iris*, or anye other Christall of the same fashion, also through some glasse wyndowe.

a pretious stone called iris.

Halone is seen aboute candelles, in smoky places, as are bathes & kychenes.

The manner of the generation of the raynbowe is suche, there is opposit against the sunne, a thycke watrye cloude, whiche is alreadye resolued into

dewye droppes of rayne, as (for a grosse similitude) is seen on the potlidde when the water in the vessell hath sodden, or is very whote, the lydde wylbe al full of small droppes of water, whiche come frō the water in the vessell, fyrst by heat resolued into smoke, after when it can not goe at large, it is resolued agayne. Wherfore vpon such a cloude, the sunne beames strykynge, as vppon a smoothe glasse, doe erpresse the image of ỹ sunne vnperfectly, for the great distāce. Or els the sunne beames, strike into an hollow cloude, where they are refracted or broken, and so cometh to the eyes of hym ỹ beholdeth the raynbowe.

A similitude.

Similitude of the raynbowe.

The similitude thereof is seen, whē men sayle or rowe in boates, the sunne shyneth vpon the water, whiche casteth on the vessels syde, the collours & image of the raynbowe.

Lykewyse water in an vrinall holdē against the sunne, receyueth the lyght & sheweth collours on the walle.

Rainbow of th sunn

Rainbow of the Moone.

There be two kindes of rainbowes, one of the sunne, another of the Moone, the one by daye, the other by nyght, the raynbowe of the sunne often, but of the

Moone

Moone very seldome, in so muche that it can be but twyse at the moste, in fiftye yeares, and that when the Moone, is in the East or West, full in perfect oppositiõ. It hath not bẽn many tymes seẽn sence the wryting of histories, yet some tymes and for the rarenes, is takẽ for a great wonder. Yet is it in collour nothyng so beutiful, as the sunnes, but for the moste part, whight, as mylke, other diuersities of collours are scant perceyued. When it appeareth, it is sayd to signifie tempest.

The tyme of the raynbowe, is often after the poynt of *Autumne*, both for the placing of the sunne in competent lownes, and also for abundance of matters, seldome or neuer is the raynbowe seẽn about the middest of sommer.

There may be many raynbowes at one tyme, yet commonly but one pryncipall, of whiche the rest are but shadowes, and images, the seconde shadowe of the first, the thyrde of the seconde, as appeare by placing of their collours.

It remayneth to shew why it is but halfe a circle, or lesse, neuermore, and why the whole cloude receyueth not the

same collours, that the raynbowe hath. The cause of the fyrste is, because the center, or mydle point of the raynbowe, that is *Diametrally* apposite to the center of the same, is alwayes either in the *Horrizon* (that is the circle cutting of our sight of heauen by the earth) or vnder it. The cause why the whole cloude is not colloured, is because that in the myddest the beames as strong, perse throughe, but on the edges where they are weaker, they are reflected or refracted.

Nowe for so muche, as God made the raynbowe a signe and Sacrament of his promyse, some thynke it was neuer seen before the floude. Their reason maye be this, that the earthe after the fyrst creation was then so fruictfull, that it neaded none, or very lytle rayne, so that suche darke cloudes, weare not often gathered, the fruictfull ground not so easely remitting his moysture, that then was fatte and clammye, harde to be drawen vp: so it myght be that ther was no raynbowe before, as we cannot fynde that euer it rayned before. But whether it were or not, it is certayne, that then it became a Sacrament, wher as it

as it was none before, which when we beholde, it behoueth vs to remember, ỹ truthe of God in all his promyses, to his glorie and our comfort.

¶ *The mylke waye called of some the waye to saint Iames and Watlyng streate.*

the white circle sene in the night.

THe milke way, is a whyte circle séen in a cleare night, as it were in the firmament, passing by the signes of *Sagittarius* and *Gemini*.

The cause thereof, is not agreedvpō among *Philosophers*, whose opinions I thought best to reporte, before I come to the moste probable causes.

Pithagoras.

First of all *Pithagoras*, is charged wᵗ a Poeticall fable, as though it had bēn caused by reason that the sunne did once runne out of his pathway, and burned this part wherof it loketh whyte.

Anaxagoras, Democritus.

Other as *Anaxagoras* and *Democritus*, sayde, that it was the light of certeine sterres, shining by them selues, of their owne light, which in the absence of the sunne, might be séen. But this opinion is also false, for the sterres haue no light of them selues, but of the sunne, also if it wer so, it shold apear about other sterrs,

Demo-

Democritus is also repoꝛted to haue sayde, that it was nothing els but innumerable lytle starres, whiche with their confuse lyght, caused that whytnes, to this opiniõ, *Cardane* semeth to subscribe.

Cordanus

Phaeton.

The *Poetes* haue fowꝛe fables of it, one that *Phaeton*, whiche on a tyme guided the Chariot of the sunn, & wandꝛing out of the way, did burne ỳ place, wherfoꝛe of *Iupiter* he was stryken downe wyth lyghtnyng.

Ouid. Meta. Pr.

The second, that it is the high strete in heauen, that goeth streight to *Iupiters* pallace, and both sydes of it, the cõmen soꝛte of Gods do dwell.

Hebe.

The thirde, that *Hebe*, one which was *Iupiters* Cupbearer, on a tyme, stõbled at a starre, and shedde the wyne oꝛ mylke, that was in the cuppe, which coloured that part of heauen to this daye, wherfoꝛe she was pout out of her office.

Apollo.

The fourth, that *Apollo* stode there to fight against the Giantes, which *Iupiter* made to appeare, foꝛ a perpetuall memoꝛy.

Theophrastus

Theophrastus a Philosopher affirmed, that it was ỳ ioyning together, oꝛ sæme of the two halfe globes, whiche made it appeare

appeare moze light in that place then in other.

Other sayde, it was the reflexion of the shyning light of fyze, oz sterre light, as it is seen in a glasse, but then it sholde be moueable.

Diodorus, affirmed, that it was heauenly fyze, condensede oz made thick, into a circle, & so became visible, wheras the rest foz the purenes, clearenes, and thinnes, could not be seene. *Diodorus*

Possidonius whose mynde to many semeth very reasonable, saide: it is the infusion of the heate of sterres, whiche therfoze is in a circle, contrarie to the *Zodiake*, (out of whiche the sunne neuer wandzeth) because it myght temper the whole compasse with vitall and lyuely heate. Although in my mynd he hath rather expzessed the finall cause, then the efficient. *Possidonius.* *Zodiake.*

Aristotles opinio is, that it shold be ẏ beames of a great circle, whiche is caused by a cloude oz *Exhalation* dzawen vp by those sterres, whiche be called *Sporades*. This opinion of *Aristotles* is myslyked of moste men, that haue trauayled in this science and wozthely. Foz if it *Arist.* *Sporades.*

were

were of the nature of elementes, as *Exhalations* are, it would be at length consumed. But this circle neuer corrupteth, therfor it is not of *Exhalatiõs*. Also it neither increaseth or diminisheth, which is a playne proofe, that it consisteth not of elementall matter. Although *Aristotle* seeme to make a double circle, one celestiall, another elementall.

The last opiniõ is of them that say, it is of the nature of heauen, thycker in substaunce then other partes of heauen be, hauing some lykenes to the substãce of the Moone, which being lightned by ỹ same, as al ỹ starres be, apereth whight. And this opiniõ I take to be ỹ most probable, because that sentẽce of sterrelight seemeth not so reasonable to be only in that place, and not els where.

The finall cause of this milkewhyte circle, hath been already touched in the opinion of *Possidonius*, wherunto also in *Plinius* in the xviij. booke & xxix. chapter of his naturall history agreeth, affirming ỹ it is very profitable, for the generation & frutefull increase of thinges that growe on the earth. The *Mathematicians* that haue measured ỹ breadth therof, affirme

Possidoni⁹ Plinius.

The breadth of this circle

that

that toward the north it passeth ouer the eclipticall lyne of the ninth spheare, frō the xviij. degrée of *Gemini* vnto the secōde degrée of *Cancer* which is xiij. degrees, & toward the South, frō the viij. degrée of *Sagittarius* to the xiij. degrée of the same signe, & because it is ther diuided into ij. branches (as may easly be séen in a clear night) it reacheth frō the xviij. of *Sagittarius* to the second degrée of *Capricorne*.

This circle if it be of the nature of heauen, is vnproperly placed amōg *Meteores* or impressions, but because of *Aristotles* mynde, who wyll haue it to be an impression kendled, & their opinion whiche thinke it proceadeth of ỹ light of sterres it is not wōut good cause in this place intreated of.

¶ *Of beames or streames of light appearing through a cloude.*

Beames or streames.

THer is yet another kind of impressiō caused by the beames of the sunne, stryken through a watry cloud, being of vnequal thinces, ỹ is thinner in one part thē in another, so ỹ it cannot receiue the beames in any other form, thē ỹ they appere direct or slope dolwnward, of diuers collors, & ỹ same ỹ ar ỹ collors of ỹ raynbow, though not so euidēt, because ỹ re-

flexion is not so strong. They varie in collours, some ar moze purple, oz ruddy, when the cloud is thicker som yealow & whitish when the cloude is thinner, & so other collozs ar caused likewise, wherof you may reade the pzoper causes in the collours of cloudes and other lyke parts of this treatise. The common people cal it the descēding of the holy ghost, oz our Ladies *Assumption*, because these things are painted after suche a sozt. Other say that it is rayne, stryking downe in another place, as though they could sée the dzoppes fallyng. And they are not altogether deceiued, but in the time, foz sone after it wyll rayne, because this impzession appeareth out of a watry cloude. They are called by dyuerse names, as roddes, wandes, coardes of tents, vnto whiche they are not much vnlyke, staues and lytle pyllers, when they séeme greater and thicker, many beyng ioyned together. The rayne bowe, the circles and these lyghtbeames, are all of one maner of generation, in so muche that if you deuide the circle, it shalbe a rayn bowe, if you dzawe it streyght, in lengthe, it maketh streames oz beames.

mes. Herein they agrée, namely in forme and matter, but they differ in outwarde forme, whiche we may call fashion, as the one is round, the other half round, & the thirde directe, streyght or fallynge a slope. Also they differ in place, aboute whiche they stande, for streames are only about the sunne, raynbowes about the sonne often, and seldome about the Mone, but circles both about the sunne and the Mone, and also about any other of all the sterres, yet rather and oftener about bryght sterres. To make an ende of these streames, they apeare diuersly, after the fashion and place wherein the cloude hangeth in respect of the sunne. For some tyme they are séen only in the edge of a cloude, all the breadth of that cloude. Sometyme through the middes of a cloude, being thynner there, then in other partes, and then they are spreade rounde about lyke a tente or pauilon vsed in warre. They ar moste commenly séen in suche tymes, as there is great aboundance of rayne, whiche they, by their apparition doe signifie not yet to be ended. And thus muche concerninge direct lyght beames called roddes &c.

¶ *Of many Sonnes.*

Manye Sunnes at once.

Alexander the great.

Darius.

IT is straunge and marueilous to beholde, the lykelyhode of that, whiche *Alexander* the great, sending woorde to *Darius*, sayde to be impossible, that two sonnes should rule the woorlde. But oftentimes, mē haue seen, as they thought in the firmament, not only two sonnes, but oftener thre sunnes, and many more in nomber; though not so often appearing. These how wonderful soeuer they appeare, proceade of a naturall cause, whiche we will endeuour to expresse. They are nothing els but Idols, or Images of the sunne, represented in an equall smoth and watry cloude, placed on the side of the sunne, & sometime on both sydes, into which the sunn beames being receiued as in a glasse, expresse ỹ likenes of fashion & light, that is in the sunne, appearing as though there were many sunnes, where as in dede there is but one, & all the rest are images. This thicke & watry cloude, is not sayde to be vnder the sunne, for then it wolde make the circles called crownes or garlonds, it is not opposit to the sunn, for thē wold it make the rainbow, but it is sayd to be on the

on the side, wher the image may be best represented. Also it may not be to farof, for then the beames will be to feble to be reflected neither yet to neare, for if it so be the sunne wil disperse it. but in a cõpetent & midle distance, for so representation of many sunnes is caused.

They are most often seen, in the morning & euening, about the rysing or going downe of the sunn, seldome at noone tyme, or about the middest of the day, because the heat will soon dissolue thẽ. Yet hath there been some seen, which began in the morning, & continued all the daye long, vnto the euening. Somtimes ther apeare many litle sunnes, like vnto litle starres, which are caused after the same sort, as we doe see a mans face, to be expressed in all the peces of a brokẽ glasse. So when the cloude hath many separations, there appeare many sunnes, on one syde of the true sunne, sometimes great, and sometimes litle, as the parts of the cloude separated are in quantitie.

Many smal sunnes like stars Similitude.

They doe naturallye betoken tempest, and rayne, to followe because they can not appeare, but in a watry disposition of the ayre.

The significatiõ of many sunnes.

Also if they apeare on the Southside of the sunne they signifie a greater tempest then if they appeare on the Northside. The reason is alledged, because ỹ Southerne *vapor* is sooner resolued into water, then is the Northerne.

For a supernaturall signification, they haue often tymes bẽn noted to haue portended, the contention of Princes for kingdomes. As not longe before the contention of *Galba*, *Otho*, and *Vitellius*, for the Empire of Rome, ther appeared thrée sunnes. Also of late toward the slaughter of *Lewes* kyng of *Hongary*, were seen thrée sonnes, betokening thre prynces that contended for the kyngdõ, namely Ferdinando nowe Emperour, John Vayuode, and the great Turke.

Galba, Otho, and Vitellius

¶ *Of many Moones.*

After the treatie of many sunnes, it weare not harde for any man, without farther instruction to knowe the naturall cause of many Moones. For they are lykewyse Images of the Mone, represented in an equall cloude, which is watry, smothe, and polyshed, euen lyke a glasse. Some call thẽ (as *Plinius* saieth) night sunnes, because they ioyned with the

Manye Moones.

Plinius.

the light of the true Moone, geue a great shynning light, to dryue awaye the shadowe and darkenes of the nyght.

It were superfluous to wryte, more of their causes, or effectes, whiche are al one with those, that haue béen declared of the sunnes.

It may be doubted why the other starres doe not lykewyse expresse theyr image, in watry cloudes, and so the nõber of them to our sight should be multiplied: it may be aunswered, that their lyght or beames, are to feble, & weake to expresse any suche similitude or lykenes in the watry cloudes. For although they haue garlandes, or circles, aboute them, that are caused in a *vapor*, that is vnder them: yet it is manifest, that this apparition hath not néede of so strong a lyght, as is requyred to prynt ẏ images of them in the cloudes. Agayne the garlandes are direct vnder, and therfore apter to receyue suche apparition.

Why other sterrs are not so represented.

It may be agayne obiected that the starres haue their image perfectly and sufficiently expressed in glasses, here on the earth, yea, and at the day tyme, whẽ their lyght is eyther none or moste feble, and

Obiectiõ.

ble, & weake, as we see it is vsed at midsommer to beholde that great starre called *Sirius*, in a glasse euen at none days.

Syrius a great star seen at none in Sommer.

Also we see euery night, the image of the starres in calme and quiet standing waters, then what shoulde let, but that their images myght also be expressed in watry cloudes.

An aunswer.

Hereto may be aunswered, that the let is in the cloude, which is neyther so harde as is the glasse, nor yet so continuall as the water, but consisteth of innumerable small droppes, so that except the light of the starres were stronger, it can in the expresse no vniforme images of them, as it doth in glasses, and in the water. Notwithstanding, in wryters of wonders, we reade some such like thing sometime to haue chaunsed.

There hathe been often seen manye sunnes, in the daye tyme, and after the sunne settinge, at the rysing of the full Mone, there haue appeared manye Mones, whiche was by this meanes that the same cloude, that receiued the sunne beames, in the morning, tarried in the same place, & at ye Mones rising, was ready also to receiue her image.

¶ *Of wonderfull apparitions.*

VVE wil close this boke, with a brief declaration of the natural causes, of many thinges, that are sæn in ẏ ayre, very wonderfull & straunge to beholde, which in these later yeares, haue bẽn often sæn and beheldc, to the great admiration of all men, not without the singular prouidẽce of God, to forwarne vs of many daungers, that hange ouer vs, in these moste perilous tymes. *Wonderful aparitions.*

The aparition of which, as it is moste wonderfull, so the serching of the cause, to vs is moste harde & difficulte. A great deale the rather, because no mã hath hetherto enterprysed (to my knowledge) to sẽke out any cause of them, but all men haue taken them as immediat myracles, without any naturall meane or cause to procure them.

And I truly, do acknowledge ẏ they ar sent of God as wonderfull signes, to declare his power, & moue vs to amẽdement of life, in dede miraculus, but not yet so, ẏ they want a natural cause. For if they be wel weyghed & cõsidered, it is not harde to finde, ẏ they differ much frõ such miracles, as ar recorded in ẏ scrip-

and admitted of diuines. So that, as I abhorre the opinio of *Epicures*, to thinke that suche thinges come by chaunce, but rather by ỹ determined purpose of gods prouidence: so I cõsent not with them, that suppose when any thing is deriued from any naturall cause, God the chiefe and best cause of al thynges is excluded.

Some of these wonderfull apparitions consist of circles and rainbowes, of diuerse fashions & placings, as one with in another, the edge of one touching another, on deuiding or going through another, with lyke placing of small circles, about great circles, or partes of smal circles, some with the endes vpward, some downward, some alyde, & some acrosse, but all for the most part in vniforme order constituted or placed, for the order of them pleasaunt to beholde, but for the strangenes somewhat fearfull. Suche a lyke apparition, is made with the sunns or Mones images, ioyned vnto these circles, set also in good & vniforme order. The cause of these is the meting together, of all those seuerall causes, that make the circles, raynbowes, streames and images of the sũne or mone, which

ioyned

ioyned altogether, make the wonderful sight of strange raynbowes, positions of circles, crosses, & diuerse lyghtes, which perteyne to the knowledge of *Optice* and *Catroptice*, that teache howe by diuerse refractiõs and reflectiõs of beames, such visions are caused. So that he, whiche wyll knowe howe they are generated, must returne vnto the seuerall treatyses of raynbowes, circles, streames, & images, of the sunne or Mone, and if in thẽ he finde not knowledge sufficient, to instructe him, I must send hym to the demonstrations of perspectiue, where he shall want nothyng. *Optice Catroptice.*

Another sort of them, no lesse often behelde within these fewe yeares, then ẏ former, but a great deale more straũge and wonderfull to loke vpon, are the syghtes of armies fighting, in the ayre, of Castels, Cities, and Townes, with whole countries, hauing in them hills, valies, ryuers, woodes, also beastes, mẽ, and foules, monsters, of whiche ther are no suche kyndes on the earth, and fynally all maner of things and actions, that are on the earthe, as burialles, processions, iudgementes, combates, men,

women, childrē, horses, crownes, armes of certayne noble men, & contries, weapons of all sortes, sometymes starres, angels, as they ar painted wt the image of Christ crucified, besieging of castels and townes, many thynges and gestures done by men or beastes, the very similitude of persones knowen to the beholders, as of late, was seen the very image of the Emperour Charles, insomuche that they which beheld it, put of their cappes, thinking verely it had bēn he, & of Jhō Frederick prince Elector of Saxon, who ỹ time was prysoner with thēperour. Also the image of small crosses, which hath ben not only in the ayre, but also on the earth, on mens apparell, on dishes, platters, pottes, & al other things so that the Jewes haue bēn full angry, that they could neither washe, nor rub them out of their aparell. In Germany, also fyers and many suche thinges, as it were long stories, seen in the ayre.

All these wōderfull aparitions, may be caused two maner of wayes, the one artificially, the other naturally. Artificially by certein glasses, and instrumēts made according to a secret part of that

knowledge whiche is called *Catoptrice*, and so peraduenture some of them haue bæn caused, but the most part doubtlesse naturally, when the disposition of the eye, hath bæn suche, that it hath receiued the image of manye thinges placed and done on the earth. And because it is apte to receyue dyuerse images, as well in one place as in another, these monstruous formes and straunge actions, or stories proceade of the ioyninge of dyuerse formes and actions, as if two histories, were confusely paynted in one, the whole picture would be straunge or (as the Poet sayeth,) if a paynter to a mans head, should set a horses neck, & after dyuerse fethers. Sometymes also, one image is multiplied in the ayr, into many or infinite, as ar letters & crosses, whiche fill all the ayre, euen beneathe. And the light of the sunne, receiued into litle partes, maketh to apeare, as it wer many smal starres. Let this suffice, concerning these wonderfull apparitions; once agayne admonishyng the Reader, thoughe I haue enterprysed to declare these by naturall reason, yet beleuing ỹ not somuch as on sparrow falleth to ỹ ground,

catoptrice

Horatius

grounde, without Gods prouidence, I doe also acknowledge Gods prouidence bryngeth these to passe, to suche ende as before I haue shewed, vsing these causes, as meanes and instrumentes to doe them.

The fourth booke
of watry impressions.

THose be watry impressions, that consist moste of water. In ỳ treaty of the, are wont to be handled, these impressiõs, namely cloudes, rayne, dew, hore frost, hayle, snowe, springes, ryuers and the great sea it selfe.

¶ *Of cloudes.*

Cloudes. A Cloude is a *vapor* colde and moyste, drawen out of the earth, or waters by the heate of the sunne, into the myddle region of the ayre, where by colde it is so knit together, that it hangeth vntill either ỳ waight or some resolution cause it to fall downe.

The place wherein the cloudes doe hange is sayde to be in the midle region of the ayre, because men see it is necessary that there shoulde be a colde whiche

should make those *vapors* so grosse, and thycke, whiche for the most part are drawen so thinne, from the earth, that they ar inuisible, as the aier is. And although they are knowen oftentime as *Aristotle* wytnesseth, to be in the lowest region of the ayre, neare to the earth, in so muche that sometymes, they fall downe to the earth, with great noyse, to ỹ great feare of men and no lesse losse and daunger. Yet may it be reasonably thought, that these cloudes were generated in ỹ midle region of the ayre, farre distant from the earth, whiche by their heuines doe by litle and litle sinke downe, lower into ỹ lowest region, and sometymes also fall downe to the earth. *Aristo.*

the height of the cloudes.

The commen opinion is, that they goe not hygher then nyne myle, whiche because it leaneth to no reason is vncertayne.

Albertus Magnus, whose reason also is to be doubted of, affirmeth, that the cloudes doe scarse exceade thræ myle in heyght, when they are hyghest. *Albert' Magnus.*

And some let not to saye, that oftentymes they ascend not past the halfe of one myle, in heyght.

Againe

Agayne other pretending to find out the truth by *Geometrical* demonstrations, make it aboue fiftie myle to the place where the generation of cloudes is

Howe these men take the distaunce from the earth, it is vncertain. whether that they assigne ỹ least distance, meane it from the hyghest part of the earth, as are hyll toppes, or from the commen playne. Againe, whether they ỹ assigne the hyghest distaunce to be from the lowest vallyes, of the earth, or from the hylle toppes.

The reason before shewed, moueth me to thynke that the moste vsuall & cõmen generation, I meane the condensation or making thick of these thinne *vapors*, into cloudes is in the midle region of the ayer. But for the distaunce of the cloudes, whẽ thei be generated I thinke they be somtime nine mile, somtime iij. myle, somtime halfe a myle, & somtyme lesse then a quarter of a myle from the earth.

¶ *Of Mystes.*

Mystes. There be two kyndes of mistes, ỹ one ascending, the other descending.

That whiche ascendeth, goeth vp out of the water, or ỹ earth as smoke, but doth not

not cõmenly ſpred ouer all other parts, it is ſeen in ryuers and moyſt places.

The other miſt, that goeth downe toward the earth, is when any *vapor* is liſted vp into the ayre, by the heate of the ſunne, which not being ſtrong enough to drawe it ſo high, that the colde maye knitte it: ſuffereth it after it is a lytle made thicke, to fall downe agayne, ſo it filleth al the ayre with the groſſe *vapors*, & is called miſtes, being vſually a ſigne of fayre weather. *Of empty cloudes.*

Empty cloudes.

There be certen cloudes, ỹ ar empty, & ſend no raine, they come of ỹ. ſortes.

For one ſorte are the remnantes of a cloude, that hath rayned, whiche can not be cõuerted into water, for ther dryenes. Another ſort is of them, that are drawen vp, of wett and dryeplaces, and be rather *Exhalations* then *vapors*, that is they be drie, whot, & light, ſo that it wer harde for them to be turned into rayne. They loke whyte lyke flocks of woile, when ỹ lyght ſtriketh into thẽ. Ther be alſo empty clouds, when ỹ wyndes haus diſperſed abrode, any cloud, they ar ſcatered euer al the ſkie, but theſe cloudes, though for a time they be emptye, yet

becauſe

because they consist of such a substaunce as is watrye, they may be and are often tymes, gathered together and geue plē-tifull rayne.

The collour of cloudes.

Of the collours of cloudes, we haue spoken in the second booke of fyry *Meteors*, where those collours and the causes of them, are described, whiche seeme to be fyerye, or may be thought to be inflamations or burninges, as be redde fyry and yealowysh.

But beside those, there be whyte, black, blewe, and greane.

Whyte cloudes be thynne, and not very watery, so that the lyght receiued in them, maketh thē to appeare whyte.

Black cloudes be ful of thick, grosse, and earthely matter, that maketh them looke so darke.

Blew cloudes be ful of thick, grosse, and earthly as the blacke, so the light receiued in them, maketh them to seeme blewe.

Greene cloudes are altogether watry, resolued into water, whiche receyuing into them the lyght, appear greene as water doth in a great vessell, or in the sea and ryuers.

Of

¶ *Of Rayne.*

Rayne.

After the generatiō of cloudes is wel knowen, it shall not be hard to learn, from whence the rayne commeth.

For after the matter of the cloud being drawen vp, and by cold made thick, (as is sayde before) heate followynge, which is moste commenlye of the Southerne wynde, or any other wynde of hotte temper, doth resolue it againe into water, so it falleth in droppes, to geue encrease of fruict to the earth, and mouse men to geue thankes to God.

There be small showers, of small droppes, and there be great stormes of great droppes.

The showers with small drops, proceade either of the small heat, that resolueth the cloudes, or els of the great distaunce of the cloudes from the earth.

The streames with great droppes, contrariwyse, doe come of greate heate, resoluing or melting the cloude, or els of smal distaunce from the earth. Whereof we see an experiment when water is powred forth, from an highe place, the droppes are smalle, but if it be not from be ight, it wyll either haue no droppes

or very great.

The cause why rayne falleth in resy droppes, is both, for that ỹ partes desire the same forme that the whole hathe, whiche is round; & also that so it is best preserued against all cõtrary qualities, like as we se water, powred vpon dye or greasy thinges to gather it selfe into roundels; to auoyde the contrarietie of heate and dryenes.

why rain water is not salt.

It is not to be ommitted, that raine water although a great part of it be drawen out of the sea, yet moste commenly it is sweet and not salt.

The cause is, because it is drawne vp in suche small *vapors*, and that salt part is consumed by the heat of the sunne.

The rayn water doubtles, doth more encrease and cherishe thinges growyng on the earth, thẽ any other water wher with they may be watered, because the rain water, reteineth much of the sunns heate in it, that is no smal comfort to all growyng plantes. The water that commeth from heauen, in rayne wyll soner come to putrefaction, or stinking, then any other, because it hath bẽn made very subtile by heate, and also for that it is

mixed

mixed with so many earthly & corrupti-
ble substaunces.

Rayne water that falleth in the sommer, by *Auicens* iudgemēt, is more holsome then other water, because it is not so colde and moist as other waters be, but whotter and lighter. *Auicen.*

Somtime ther is salt rain, whē som *Exhalatiō* which is whot & drie, is cōmixed w̄ the *vapor* wherof the raine cōsisteth. *Salt raine.*

Sometime it is bitter, when summs burnt earthly moisture is mixed withit. This rayne is both vnholsom & also vnfruictful. *Bitter raine.* In these coūtries, ther is great store & plenty of rayn, because the sunne is of such tēperat heat, ỹ it gathereth many *vapors*, & by immoderat heat doth not consume them. But in ỹ East partes, in some whot cōtries, it neuer or seldom is seen to rain, as in Egipt & Siria, but in steade of rain Egipt hath ỹ ryuer *Nilus*, whose ouerflowings, doth marueloully fatten ỹ earth. In *Syria*, & other like coūtries, they haue more plentifull delue, then we haue, which doth likewyse make their earth exceading fruictfull. *The riuer Nilus.*

Seneca testifieth, that ỹ rayn soketh no deper into the earth thē kenn foot deep. *Seneca.*

¶ *Of the signes of Rayne.*

Signes of rayne.

FIrst if the skie be redd in the morning, it is a token of rayne, because these *vapors* which cause the rednes, wylbe shortly resolued into rayne.

If a darke cloude be at the sunne rysing, in whiche the sunne soone after is hidde, it wyll desolue it, and rayn wyll followe. If then appeare a cloude and after *vapors* are seen to ascend vp to it, that betokeneth rayne.

If the sunne or Mone loke pale, loks for rayne.

If the sunne in the East, seem greater then commonly he appeareth, it is a signe of many *vapors* whiche will bring rayne.

If the sunne be seen very earlye, or fewe starres appeare in the nyght, it betokeneth rayne.

The often chaunging of the wynds, also sheweth tempest.

The moste suer and certaine signe of rayne, is the southerne wynde, whiche with his warmenes, alwayes resolueth the cloudes, into rayne.

When there is no dewe at such tymes as by nature of the tyme, ther shold be, rayn

be, rayne followeth, for the mater of the dewe, is turned into the matter of watrie cloudes.

If in the Weſt about the ſunne ſetting, there apeare a black cloude, it wyl rayne that nyghte, becauſe that cloude ſhall wante heate, to diſperſe it.

When muche duſt is rayſed vp, and when the woddes make a great noyſe, ſome tempeſt is towards.

Hard ſtones wylbe moiſt and ſweat againſt rayne, lamps, and candles, by ſparcling, frogges crying, trees breaking, leaues falling, and duſt clottering forewarne vs of a tempeſt.

Flees, flyes and gnats, byght fore toward a tẽpeſt, kyne fæd greadely, birds ſæke their vitels more beſilie, for in the groſſe ayer diſpoſed to rayne, their ſtomack is whoter and they more hongry. But theſe kynde of ſignes perteine not ſo properly to *Meteorologie*, as to maryners and huſbãdrie, which haue a great many more then theſe. And *Virgil* in his firſt booke of *Georgikes*, hath a great nomber for them, that lyſt to learne. Wherfore let theſe hetherto ſuffice.

¶ *Of monstruous or prodigious rayne.*

Of monstruous rayne.

HEtherto we haue made mentiõ only of naturall rayne, & that which is cõmon whiche no man doth marueile at. But ther is somtime such rain, that worthely may be wondred at, as when it raineth, wormes, frogs, fishes, blood, milke flesh, stones, wheat, iron, wol, brick and quicksiluer. For historyes make mentiõ, that at diuerse times, it hath rained such thinges, whose naturall cause for the moste parte, we will goe about to expresse, notwithstandinge accomptinge them amonge suche wonders, as God sendeth to be considered, for such endes, as we haue before declared. Wormes & frogges may thus be generated, when fat *Exhalations* ar drawen vp into ỹ ayre by a temperature of whott & moist, such vermyn may be generated in the ayr, as they are on the earth, without copulatiõ of male & female. Or els that with the *Exhalations* & *vapors*, their seede & egges are drawen vp, which being in ỹ clouds brought to form, fal down amõg ỹ rain.

Wormes & frogges

Fishes.

Milke.

Likewyse the spawne of fishes, being drawne vp maketh fishes to rayn out of the cloudes. The vehement heate of the sunne,

sunne, in sommer and specially in whot contries, draweth mylke out of the pappes of beastes & cattel, whiche being caried vp in *vapors* and resolued again into mylke, falleth downe lyke rayn.

After the same maner the sunne also from places where bloud hath ben spilt, draweth vp great quantitie of bloud, & so it rayneth bloud. *Bloud.*

It raineth flesh, when great quantitie of bloud being drawen vp, it is clottered together and sæmeth to be flesh. *Flesh.*

Auicen sayeth that a whole calfe fel out of the aire, and some wold make it seme credible, that of *vapors* and *Exhalations* with the power of the heauenly bodies, concurring, a calfe, myght be made in the cloudes. But I had rather thynke, that this calfe was take vp in som storm of whirlewynd, and so let fall again, thē agrée to so monstruous a generation. *Auicen.*

It is a great deale more reasonable, that stones of earthly matter gathered in cloudes, shoulde be generated as we haue said before of ẏ thōderbolt. Yet som men thinke, ẏ wynd in caues of ẏ earth, breakig vpward violētly, carieth before it, earth & stones into ẏ ayre, which can *Stones.*

long abide, but fall downe and are corrupted amõg prodigius rayne. *Exhalations* that be earthy and drawne out of claye, haue muche grosse substaunce in them, which gathered together, & by gret heat burned in the clouds, make brick, which is no great meruayle.

Brycke.

Ye that hath sæn an egges shell full of dewe, drawen vp by the sunne into the ayre, in a May morninge, wyll not thynke it incredible, that wheat & other grayne, should be drawen vp in muche whotter countries then ours is, muche rather the meale or flower whiche is lighter.

Wheate.

A certayne mossynes, lyke woll, as is vpon quinses, wyllowes, and other yonge fruictes and trees, is drawen vp of the sunne, among the *vapors* and *Exhalations*, which being clottered together, falleth downe lyke lockes of wolle.

Walle.

Quicksiluer all men knowe, with small heate wylbe resolued into mosse thinne *vapors*. Whereof when quantitie is drawent vp, it falleth down agayne. As it is redde, that once at *Rome*, it rayned quicksyluer, wherewith the brasen mony being rubbed, it loked like siluer.

Quick syluer.

Titus Liuius, maketh mention, that it rayned chalke, whereof the cause can not be hydde to them, that reade howe stone and brick come into the ayre. *Chalke. T. Liuius*

Iron hath also rayned out of ỹ clouds, and sundry tymes, as histories wytnesse. Wherof this hath ben the cause. The generall matter of all metalles, with is quicksiluer, and brymstone, which the speciall matter of mixtion, that maketh irone, weare all drawen vp together, & there concocted into the metall, so came the straunge rayne of iron. *Iron.*

Auicen sayeth, he sawe a piece of trō that fel out of the cloudes, that weighed about an hundred pound weyght, wher of very good swerdes were afterwardes made. *Auicen.*

¶ *Of Dewe.*

DEwe is that *vapore*, whiche in spring and *Autumne*, is drawen vp by the sunne in the daye tyme, whiche because it is not caried into the midle region of the ayre, abidyng in the lower region, by colde of the nyghte, is condensede into water, and falleth downe in verye smalle droppes. *Dewe.*

There is cōmen dewe & swete dew.

Manna.

One kynde of the ſweet dewes, is called *Manna*, being whyghte lyke ſugar, whiche is made of thicke and clammye *vapors*, whiche maketh it ſo to fall thicke and whyte. It falleth onely in the Eaſt partes. As for that *Manna* which God rained to the Iſraelites was altogether miraculous. In *Arabia* (as *Plinius* wryteth) is a very pretious kynde of dewe, ỹ is called *Ladanum*, whiche falling vpon the herbe *Cuſus*, & mixed with the iuyce of that hearbe which goates do eate, is gathered of goates heares and kept for a great treaſure. Ther is another kinde of ſwete dewes, that falleth in England called the meldewes, which is as ſweet as hony being of ſuch ſubſtance as hony is, drawē out of ſweet herbes & flowers.

Plinius.
Arabia
Ladanū.
Cuſus.

Ther is alſo a bitter kynde of dewe that falleth vpon herbes, and lieth on them lyke brann or meale, namelye because it is of an earthly *Exhalation*, & ſo remayneth, when the moyſter is drawē away: this dewe kylleth herbes.

bitterdew

The commē dewe, dronke of cattel, doth rotte them because the matter is ful of viſcoſitie, bringing thē to a flurio.

Ther be thre thinges, ỹ hinder dewe

from

from falling, that is great heate, great colde, and wynde. For dewe falleth in the most temperat calme tyme.

¶ *Of hore frosse.*

HOare frost or whight frost, is nothig els but dewe congeled by ouermuche colde. The South and East wynd, doth cause dew, but the North and Northern wyndes, doe fryese the *vapors*, and so it becommeth hoare frosse, whiche if that excessiue colde had not bēen, should haue turned into dewe. *Hoarfrost*

The dews and the hoare frost, agrée in thre thinges, namely in matter, in qualitie of time, and place of their generation. In matter they agrée, for they are both generated of a subtile & thinne *vapor*, also small in quantitie.

In qualitie of tyme they consent, for both are made in a quiet & calme tyme, for if there were great wynde, it would dryue away the matter, and so cold ther be no generation.

Thyrdly they are both generated in the lowest region of the ayre, for (as *Aristotle* affirmeth) vpō high hilles, ther is neither dewe nor hoare frost. *Arist.*

They differ also in thre things. For the

the hoare frosse is congeled before it be turned into water, so is not the dewe.

Secondly, the dewe is generated in temperate weather, the whight froast in colde weather.

Last of all, whote wyndes, as the South and East do cause dewe, but cold wyndes as the Northe and Weast doe cause hoare froast.

Hoare froast doth often stynke, because of the stinking matter whereof it consisteth, which is drawen out of lakes and other muddy and stinking places.

¶ *Of Hayle.*

Hayle. HAyle is a hotte *vapor* in the mydle region of the ayre, by the cold of that region, made thicke into a cloude whiche falling downe to the soden colde of the lowest region is congeled into Yse.

There be so many kyndes of hayle, as ther be of rayn. The fashion of hayl, is sometyme round, whiche is a token y it was generated in the mydle region of the ayre, or very neare it, for falling frō hygh, the corners are worne away.

When the hayle stones are square, or thre cornered, the hayle was generated neare the earth.

Often

Often times, there is harde a great sounde in the cloudes, as it were of thōder, before hayle, or as it were of an army fighting &c. the cause is, that *vapors* of contrarie qualities, beinge inclosed in the cloude, doe striue to breake out, & make anoyse euen as colde water doth put into a seathing pot.

In spring and harueſt tyme, is often hayle, seldome in sommer and wynter. In wynter there wanteth whot *vapors*, in sommer, the loweſt regiō is to whot, to congele the rayne falling downe. In spring and *Autumne*, there wanteth neither whot *vapors*, to reſiſt the colde, nor sufficient colde to harden the droppes of that whot shower of rayne.

The hayleſtones are somtimes greater, and sometimes leſſer: greater with greater colde, and leſſer with leſſer cold.

There is seldome haile in the night, for want of whot *vapors* to be drawē vp.

Sometime hayle & rayne, falleth together, when the latter end of the cloud for want of colde in the loweſt region, is not congeled.

Hayle ſtones ar not so cleare, as Iſe, becauſe they are made of groſſe & earthy

vapors,

vapors, ise is congeled of cleare water.

Hayle is soner resolued into water, then snowe, because it is of a more sodē and swyft generation.

¶ *Of Snowe.*

Snowe. SNowe is a cloude congeled by greate colde, before it be perfectlye resolued from *vapors* into water.

Snowe is whyght, not of the proper colour, but by receiuing the lyghte into it, in so many small partes as in some, or the whyghte of an egge beaten.

Snowe is often vpon highe hilles, & lieth long there, because their toppes ar colde as they be neare to the mydle region of the ayre. For oftentimes it rayneth in the vallye when it snoweth on the hylles.

Snowe melting on the high hilles, and after frosen agayne, becommeth so hard that it is a stone, & is called *Christal.*

Originall of Crisall

Other matters of snowe because they ar cōmen with raine, are nedeles to be spoken of. To be shorte, sleet is generated euen as snow, but of lesse colde, or els beginneth to melte in the falling.

Snowe causeth thinges growing to be fruitfull, and encrease, because the colde

cold dryueth heate vnto the rootes, and so cherysheth the plantes.

Of Springes and Riuers.

The generation of sprynges is in the bowels of the earth, & therfore some thing must be sayde of the bodye of the earth. The earth though it be solide and massy, yet hath it many hollow gutturs and vaynes, in whiche is alwayes ayer to auoyde emptines. For the ignoraunt in Philosophie must be admonished, þ all thinges are full, nothing is emptye, for nature abhorreth emptines, so that where nothing els is, there is ayre and *vapors*, whiche by colde as it hath often ben sayde, wylbe resolued into droppes, as we see experience in marble pillers & suche lyke harde stones, towards raine. This aier and *vapors* therfore being turned into droppes of water, these dropps sweet out of the earth, and fynde some issue at the length, where many beyng gathered together make great aboundaunce of water, which is called a fountayne or sprynge. The cause why suche sprynges doe runne continually, is because that aire can neuer wante in those vaines, which by colde will alwayes be turned

Springes.

Nothing is empty.

turned into water, so that as fast as the water runneth forthe, so faste is ayer agayne receyued into the place, whereby it commeth to passe, ỹ so many springes are perpetuall, and neuer dried. But if any be dried vp, it is in a whot sommer, and such springs also they be, whose generation is not depe in the earth, & therfore the *vapors* may be made dyre & the earth warme, so the spryng may fayle.

¶ There be foure kyndes of sprynges, fountains, brokes, ryuers, & lakes.

¶ *Of Fountaines.*

Fountains. FOuntaines be small springes, which serue for wells and conductes, when there is but one place, where the water is generated, and that is not very abundaunt, ether because it is of small compasse, or small vaynes and not many.

¶ *Of Brookes.*

Brookes. BRokes, bornes, or fordes, be small streames of water, that ronne in a chānell, lyke a ryuer. They are caused whē either the spryng occupieth a great compasse, or els two or thre small springes meate together in one channell.

¶ *Of Ryuers.*

Ryuers. Ryuers are caused by the meatynge toge-

together, not only of many springs, but also of many brooks & fordes, which being receiued in diuerse places, as they passe ar at the lēgth, caried into ẏ broad sea, for the moste part. Howbeit some riuers are swallowed vp into the earth, which perchaunce runne into the sea by some secret and vnknowen channels, some ryuers there be, that hide their heddes vnder the earth, and in another place, farre of breake out againe. They wryte also, that some ryuers being swallowed vp of the earth, in one Ilande do runne vnder the bottome of the earth & sea, and breake forth in another Ilonde. There be also many great ryuers ẏ run vnder the earth in great caues which neuer breake foorth. *Aristotle* sheweth of pondes & lakes, that be vnder the earth. And *Seneca* speaketh of a pond that was founde by suche as digged in the earth, with fishes in it, & they that did eate of them died. As ēeles ẏ be founde in darke places, as wells that haue bēen dammed vp &c. are poyson. ¶ *Of Lakes.*

Arist. *Seneca.*

LAkes ar made by the meting together of many ryuers, brookes & springs into one deepe valley. Whereof some are so

Lakes.

great, that they haue the name of seas; as ỹ great lake called *Hircane*, or *Caspiã* sea. These lakes sometymes vnlade thẽ selues into the sea, by small riuers, sometymes by passages vnder the earth.

The cause of the swiftnes of ryuers, is double, for they are swyfte either for the great aboundaunce of waters, or els because they runne downe from an hylly place, as the ryuer *Rhene* falleth downe from the toppe of wonderfull hyghe hylles.

¶ *Of whote bathes.*

Whote bathes.

SOme waters that are generated and flowe out of vaynes of brymstone, are sensybly warme, and some very whott, because they runne out of whot places. These waters being also dryng by nature, are wholsome for many infyrmities, specially breakyng forth of scabbs. &c. Suche are the bathes in the Weste countrye, and S. Ann. of Buckstones well in the North part of England and many other els where.

¶ *Of the diuerse tastes that are perceiued in wells.*

Tastes of waters.

FOr a generall reason, the waters receyue their tast of that kynde of earth, throughe

through which they runne as through a strainer. Some salt, that runn through salt vaynes of the earth, som swēt, that be well strayned, or runne through such myneralls as be of swēt taste.

Some bytter, ỹ flowe out of such earth, as is bitter by addustion or otherwyse.

Some sower or sharpe lyke vineger, which runne through vaynes of allum, copporous, or suche mineralls. *Aristotle* wryteth of a well in *Scicilia*, whose water the inhabitauntes vsed for vyneger. In *Bohemia* neare to the citie called *Bilen*, is a wel that the people vse to drinke of in the mornyng, in steade of burnt wyne. And in dyuerse places of Germany, be sprynges, ỹ tast of such sharpnes.

aristotle. *Well water vsed for vineger.* *Bohemia.*

Some haue the taste of wyne, as in *Paphlagonia*, is a well that maketh men dronke which drynke thereof: which is because that water receyueth the fumōsitē of brymstone, & other mineralls through which it runneth, and so filleth the brayne as wyne doth.

Paphlagonia.

¶ *A recitall of such ryuers and springes, as haue marueilous effectes whereof no naturall cause can be assigned by most mē, although some reason in a fewe may be founde.*

maruelus water. *Clitũnus.* *Properti⁹.* *Boetia.* *Melas.* *Seneca.*

CLitumnus which maketh oxẽ, ẏ drinke of it whyght, it is a ryuer or spring in Italie. *Propert. lib. 3.* This may be ẏ qualitie of the water very flegmatike. In *Boetia* is a ryuer called *Melas*, ẏ maketh shepe blacke if they drinke thereof.

Seneca speaketh of a ryuer ẏ maketh redde heares. These two with the fyrst, may haue some reason, that the qualitie of the water may alter complexion, and so the collor of heares may be changed, as we sée in certaine diseases.

Libia. *Seneca.*

In *Libia* is a spring, that at the sunne rysing and setting, is warme, at midday colde, and at midnight very whott: this may be, by the same reason that welwater is colder in sommer thẽ it is in wynter. *Seneca* wryteth, that there be ryuers, whose waters are poyson, this maye be naturally, the water running through poysonous minerals, taking much fume of them. Other wells that make wodde and all thing els that be cast into them stones, such welles be in Englande the cause is great colde.

Another well, maketh men madd ẏ drinke thereof. This also may haue as good reason as that whiche maketh mẽ

drouke.

dronke. As also that well which maketh men forgetful by obstruction of ỹ brain.

The same *Seneca* speaketh of a water that being dronke, prouoketh vnto lust and lechery. And why may not that qualitie be in a water, which is mixed with diuerse mineralls, and kindes of earth, which is in herbes, rootes, fruict, liquors.

S. *Augustin* speaketh of a well in *Egipt*, in which burning torches are quenched, and being before quenched, are lighted. *S. Augustine.*

Among the *Garamantes* is a well so colde in the daye, that no man can abyde to drynke of it, in the nyght so whott, that none can abyde to fele it. *Garamantes.*

It is incredible, that is wrytten of a well in *Scicilia*, whereof if theues did drinke they were made blynde. *Scicilia.*

In *Idumea* was a well, that one quarter of a yeare was troubled and moddy, the next quarter bloddy, the third grẽn, and the fourth, cleare. *Idumea.*

Seneca wryteth of another well that was six houres full and runninge ouer, and six houres decresing and emptie, per chaunse, because it ebbed and flowed, with the sea, or some great ryuer that was neare it. *Seneca.*

Anthracius.

In the hill *Anthracius*, is sayde to be a well, whiche when it is full, signifieth a fruictefull yeare, when it is scarce and emptye, a barren and deare yeare. The sufficiens of moysture, maketh fertilitie, as the wante causeth the contrary.

Hũgaria

Men saye there is a Ryuer in Hungarye, in whiche Iron is turned into coper. Whiche may well be, seyng inke in whiche is but small coperus, and artificially myxed, of Iron, dothe conterfeyte coper in collour. In this streame maye be muche coperus, and that is naturally myxed.

Seneca Theophrastus.

Both *Seneca* and *Theophrastus*, wytnesse, ỹ waters there be, whiche within a certayne space being dronke of sheepe, as (*Seneca* sayeth) of hyndes (as *Theophrastus* will haue it) changeth their collours frõ black to whyte, & frõ white to black.

Vitruuius Arcadia Nonacrinus.

Vitruuius wryteth, that in *Arcadia*, is a water called *Nonacrinis* whiche no vessell of syluer, brasse, or Irõ, can hold, but it breaketh in pieces, and nothynge but a mules hoofe, wyll holde it and conteyne it.

Illyria.

In *Illyria*, garmẽtes ỹ are holdẽ ouer amoste cold well, ar kindled & set on fyre.

In the

In the Ile of *Andros*, where the tẽple of *Bacchus* stode, is a well that the fift day of January flowed wyne. *andros* *Bacchus.*

Isidore sayeth, there is a well in Italy, that healeth the woundes of ẏ eyes. *Isidorus.*

In the Ile of *Chios*, is a well that maketh men dulwitted, that drinke therof. *Chios.*

There is another that causeth men to abhorre lust.

Lechnus a spryng of *Arcadia*, is good against aborcions. *Lechnus.*

In *Scicilia* are twe spryngs of which one maketh a woman fruictfull, and the other barren. *Scicilia.*

In *Sardania*, be whote welles that heale sore eyes. *Sardinia.*

In an Ile of *Pontus*, the ryuer *Astares*, ouerfloweth the fieldes in whiche the shẽepe that be fedde, doth geue black mylke. *Pontus.* *astares.*

In *Aethiopia*, is a lake, whose water is lyke oyle. *aethiopia.*

Also manye spryngs of oyle haue brwken forth of the earth, which cõmeth of the *viscositie* or fatnes of ẏ same earth.

The lake *Clitorie*, in Italye, maketh men that drynke of it to abhorre wyne. *Clitorius.*

The lake *Pentasium* (as *Solinus* saith)
Pentasiū. is deadly to serpentes & wholsom to mē.
Solinus. *Seneca* wryteth of certeyn lakes that
wyll beare men which can not swymm.
Syria. And that in *Siria*, is a lake in whiche
brickes do swymme, and no heuy thing
wyll sinke.

It is said, that the ryuer *Rhene* in Ger
Rhenus. many wyll drowne basterd childrē that
be cast in it, but dryue alonde them that
be lawfully begotten.

The ryuer *Hypanis* in *Schithia*, euery
Hypanis Schithia. day bryngeth forth litle bladders, out of
whiche flyes do come that die the same
nyght.

Matrona the ryuer of Germany, as ỹ
Matrana. common people saith, neuer passeth day
but he taketh some praye.

¶ *Of the Sea.*

The sea. The sea in this treatise, hath place as
a mixed substaunce, for els the elemēt
of waters being simple, were not here
to be spoken of.

The natu rall place of the wa ter. The sea is the naturall place of the
waters, into which all ryuers and other
waters, are receiued, at the length.
And here it is to be vnderstanded, ỹ
the very proper & naturall place of the
water,

water, were to couer al the earth, for so be the elementes placed. The earth lowest, & roūd about the earth, the water, about the water the ayre, and about the ayre the fyre. But God the most mighty and wyse creator of all thinges, that the earth might in som partes be inhabited of men and beastes, cōmaunded the waters to be gathered into one place, that the dzie londe might appeare, and called the dzie land earth, and the gathering of waters he called seas. Gen. 1.

In the sea are these two thinges to be considered, the saltnes, & the ebbinge and flowyng.

¶ *Of the saltnes.*

THe saltnes of the sea, accordinge to *Aristotles* mynde is caused by ỹ sunn, that draweth from it all thinne & swete *vapors*, to make rayne leauing the reste as the setling or bottom, whiche is salt. But men of oure tyme, peraduenture more truely, do not take this for the only and sufficient cause, to mak so great a quantitie of water salt, but say, that the sea by Gods wysdome is gathered into such valleys of the earth, as were other wyse barren & vnfruictful, such earthes *Aristi.*

are salte, the sea water then mixed with that earth, must nedes be salt, els ryuers by *Aristotles* mynde, should be salt as well as the sea. The Reader maye chuse whiche opinion is most probable.

¶ *Of the ebbing and flowyng.*

Ebbinge and flowing. aristotl.

The ebbing and flowing of the sea, as *Aristole* semeth to teach, is by reason of *Exhalations*, that be vnder the water, whiche dryue it to and fro, according to contrary boundes, and limites, as vpwarde and downwarde, of wyde and narowe, deepe and shallowe. This opinion of *Aristotle* also, as more subtile thē true experiēce teacheth men to mislike & to ascribe the cause of ebbing & flowyng to the course of the mone, which ruleth ouer moysture, as the sunne doth ouerheate, for frō the new Mone to the full, all humors do encrease, and from the ful to the newe mone, decrease agayne. Also the very true tyme of the ebbing and flowyng may be knowen, by the course of the Mone. with whome as the ladye of moysture, we will close vp the fourth booke of moiste and watry impressiōs.

The

The fift booke of earthly *Meteores* or bodies perfectly mixed.

THis last treatise conteyneth suche bodies whose chiefe matter is the earth, & are called pfectly mixed because they ar not easly resolued in to the chiefe matter, wherof they ar generated. These are deuided into foure kyndes. The first be diuerse sortes of earth, the second be liquors concreat, the third be metalls and metalliques, the fourthe be stones. This deuision is not altogether perfect both for that ther be many of these mineralls whiche partake of two kyndes, & also for that the names of some of these kyndes may be sayde of other. Yet myndyng as plainly as can be, to declare the thynges them selues, the controuersye and cauillation of names, shall not greatly trouble vs. Especially seyng we pretende not to teache Philosophers, but such as nede a ruder & plainer instruction. They may therfor be cõtẽt wt this diuisiõ, which shal not serue them to dispute of these matters, but to vnderstãd ye truth of these

Earthly bodies.

thinges that they desyre. Of these sowr, therfore we will speake orderly and generally, not mynding to intreate of euery particuler kynde (for that were infinit) but to open suche vniuersall causes, as they whiche haue witte, may learne, (if they list) to apply vnto al particulers.

¶ *Of earthes.*

Of earths The earth is an element, one of the foure, cold and drie, moste grosse and solyde, moste heauy and weighty, the lowest of all other in place. When I saye an element, I meane a simple body vncompounded. This earth is no *Meteore*, but as it was shewed in the water, to ỹ end ther should be generatiõ of things, there is no element that we can haue, whiche is pure and symple, but all are mixed and cõpounde. Our fyre is grosse and compounde, so is our ayer our water, and our earth. But the earth notably and aboue the rest is mixed. For the puer and naturall earth is drye and cold, but we sée much to be moist, and much to be hoat The naturall earth is blacke of colloz, but we sée many earthes white many yelowe, and many redde. So that first the greatest part of ỹ earth is mixed with

with water, that maketh it to cleaue to gether, with ayer and some fyre, which make an oyly fatt or claymy earth, as is claye made. &c. Another great part is dryed not into the natural dryenes of the first qualitie, but as a thing ones mixed and after dryed, ether by to cold, as sand grauell, &c. or els by heate, as chalke, oker &c. And yet somwhat more plainly and particularly to discourse vpon these causes, admitting the naturall collour of the earth to be black, of ỹ water to be bleiwe, of the ayre to be whyte, & of the fyre to be ruddy, it followeth that vpon the mixtion of these collours, or chief domination of them, al thinges hath their collour. The grosse substaunce of the earth therefore beinge diuersly myxed with other elementes, and those myxtures againe being eftsones altered, by dyuerse and sometime cõtrary qualities, hath brought forth so manye kyndes of earth, as claye, marle, chalke, sand, grauell &c. Claye is mixed with fat moisture takyng his colloure of the mixture with redde from whyte, but beyng colde, it is not so fructfull as marle, whiche is not alwayes so moiste as it. Chalke is an

earth

earth by heat cõcocted, after diuerse mix tions and dried vp. Oker both yelow & redde with suche like are of the same na ture with mixtiõ of redde more or lesse.

Sande and grauell are dried erthes, as it were froasen by colde, grauell is grosse and apparent, sand though it be finer, is of the same generation cõsisting of many small bodies, which ar cõgeled into stones. Sãd semeth to be clay dried by cold and coacted together into small stones, wherof some ar through shining which were the moyst partes, the thicke were of the grosse parte. The same is grauel, but of greater stones consisting. The lyke iudgement is to be geuen of all other kyndes of earth, whose gene- ration by the similitude of these, wyll not be very harde to synde out. They that lyst to knowe the diuerse kyndes of earthes, must haue recourse to *Plinius*, *Cardane*, and other wryters, that recite a great nomber of them, but these are the chief and most commen kyndes.

Plinius.
Cardanus

¶ *Of liquors concreat.*

WE take not lyquors cõcreat so lar- gely, as the worde dothe signifie, for than should we comprehende, bothe the o-

the other kyndes followyng. But onely those liquors, called in latin *Succi*, which are as it were midle betwene metals & stones, of whiche some being fat & oyly, do burne, as brimstone, sæcoles, geate, *bitumen*, &c. and the kyndes of all these. other some doth not burne, as salt, alū, coperus, saltpeter, &c. and the kindes of these. Of the first sort, which are generated of earthy & ayry *vapors*, fumes & *Exhalations*, the chief & most notable, is brimstone, which semeth to be the matter of all drie & whot qualities, ẏ ar in earthly *Meteores*. The rest are generated of such lyke *vapors* as brymstone is, but thē they be diuersly mixed. As ẏ coles, haue much earth mixed with brimstone. Gette, sæmeth to be all one, but better concocted then coles. Of amber is great contentiō whether it be a mineral, or ẏ sperme of an whale, for it is foūd in the sea, cast vpon the shore. Now ẏ whales sæde, being of the very same qualities, is takē more & lesse cōcreate of diuers hardnes, som almost as hard as amber, som softer, & som liquid. Yet *Cardan* plainly defineth, that amber is a minerall. Whether he haue reason or experiēce, cōtrary to ẏ vulgar opinion, *Cardanus*

opinion, let them consider that list to cõtende. These minerals that will resolue with fyre, it is apparent, that they were concreat with colde. In that they burne it is manifest, they haue a fatte and clãmy substaũce, mixed with them. As the other kynde hath not, whiche wyll not resolue so well with fyre, as wõ water, whiche be salt, coperus, saltpeters, &c. these burne not being watry, earthy, & not fatt, vnctuus, nor clammy.

These be of diuerse collours, black as coles and geat, because ther is much earthy substaunce mixed with their sulphureus matter. Some be shere as saltt and alume, hauing a substaunce watry, dryed, and concreat. Coperus is greane, because it hath muche colde matter that is bilwe, mixed with it. Salt the most cõmen and necessary of all these liquors concreat, that be moist & not fatty, hath two maner of generations, one naturall, and the other artificiall. The naturall generation, is when it is first generated, in the earth, after commeth the water of the sea, and is infected with it, out of whiche the salt is againe artificially gathered. Of these liquors concreat be those

be those strange wells and sprynges infected, of whiche was spoken, in the latter ende of the fourth boke. Most notably brimstone causeth the whot bathes, and burneth in *aetna*, of *Sicilia*, and *Vesuuius* of Italye, casting vp the pumise stones, of whiche is no place here to entreate. *Aetna & Vesuuius*

¶ *Of Metalles.*

METalles be substaunces perfectlye myxed, that wyll melte, with heate, and be brought into all manner of fashions that a man wyl. Of these the Alcumistes saye, there be seuen kyndes, to aunswere to the seuen Planetes. Gold, syluer, copper, tynne, lead, Iron & quicksyluer, that they cal *Mercury*. But sauing their authorities, quicksyluer is no more a metall, then brymstone, whiche is as necessarye to the generation of metall, as quicsyluer is. For they all agrée, that all metalles are generated of sulphur, that is brymstone, whiche because it is whot, they call the father, and *Mercury* that is quicksiluer, whiche because it is moyst, they call the mother. So by as good reason, may they call brymstone a metalle, as *Mercury*. Then there remai- *Metalls.* *Mercury.* *Sulphur.*

neth but six perfect metalls, Gold, Syluer, Copper, Tinne, Lead, and Iron.

¶ *Of Golde.*

Golde.

THat moste vnprofitable and hurtfull of al metalls golde, which most men dispraise, and yet all men would haue, is of all other metalles the rarest, it is only pfect, all other be corruptible. Gold neuer corrupteth by rust, because it is pure from poysonus infection & most solide, that it receiueth not the ayre into it, which causeth all thinges to corrupt. It is perfectly concocted with sufficient heate, and mixture of Sulphur, all other metalls, either are not so well concocted, or els they haue not the due quãtitie of brimstone. This opiniõ hath also place among the Alcumistes, ỹ because nature in al her workes, seketh the best ende, she entẽdeth, of al metals to make gold, but being let either for wante of good mixture, or good cõcoction, she bringeth forth other metals, in deede not so precius, but much more profitable, & the lesse pretius, the more profitable, for ther is more vse to the necessitie of mannes life, in Iron and lead, then is in golde, & syluer. But either the bewtie, or the perfection,

Why gold rusteth not.

The opinion of the Alcumistes.

fectiō, or at leſtwyſe the rarenes of golde & ſiluer, haue obteineth the eſtimatiō of al men, ſo ỳ for them is ſold al maner of things, holy, & prophane, bodely & ſpirituall. What paynes deth not men take to wynn golde: euery man hath one way or other, to hunt after it, but ỳ Alcumiſt deſpiſing all other wayes as ſlow, vnnaturall, & vnprofitable, laboreth ether to helpe nature in her worke, as of vnperfect metals to make pfect, or els to force natur to his purpoſe, by his *quinteſſence* & *elixirs*, ſo that what by purging, what by cōcocting, what by miring of ſulphur & quickſiluer, & muche other like ſtuffe, at leugth he turneth the wrong ſide of his gowne outward, all the teeth out of his head, & his body frō helth to a palſey, and then he is a Philoſopher, and ſo he will be called.

¶ *Of Syluer.*

Siluer.

SIluer the moſt pure metalle, next vnto golde, hath indifferent good concoction in the earth, but it wanteth ſufficiēt heat in the mirtur, that maketh it pale. It is founde as they ſaye, running into diuerſe vaines as all other metalles be, but this moſt ſpecially, after ỳ ſhape & fa-

of a tree, lying alonge with a bodye or stocke of proportion lyke to the body of a tree, also with armes, braunches, leaues and fruictes. This metall syluer, lacketh sufficient heate, and therfore cõmeth neyther to the collour, soliditie, nor perfection of golde, and is generated in colde countries, neare vnto the North, and South poles. In so greate quantitie, that husbandmen, when they plowe the grounde turne vp syluer, among the clottes in their dayly labours. Whiche they doe hyde, and conceale, least the gready Princes, for couetousnes of the metall, should ouerturne and destroye their lande. The golde mynes, are contrarywyse, moste founde in the whote countries of *India* and *Aethiopia*, because in them is sufficient of heate for that vnhappy generation.

This syluer also, the Alcumistes woulde fayne make by arte, but *Mercury* the chiefe maister of the worke, is so subtill, and so slye, that nothinge can holde hym, nothing can kyll hym. For if the glasse be not very thyck, he wyll soone breake out of pryson, and so there is nothyng left.

Of

¶ Of Copper.

Copper.

COpper in collour, comming neareſt to golde, beyng not ſolyde, noꝛ maſſy, (foꝛ of all metall golde is the heauieſt) geueth waye to coꝛruption, beyng infected with that greane minerall copperus. Hereof be dyuerſe kyndes, bꝛaſſe, latine and ſuche lyke, whiche differ in in digeſtion, the copper beyng pureſt, is of beſt digeſtion and neareſt vnto golde, and ſo the reſt in lyke degrees. Copper is moſte lyke to ſyluer in the wayghte, and in the hammeryng, wherefoꝛe the Alcumiſtes haue learned to make it whyte, that it deceyueth mens ſyghte & handlyng, but the Goldſmythes doe eaſely tꝛye it & by the teaſt of coũterfect ſiluer, maketh copper agayne. Copper oꝛ bꝛaſſe, doth alwaye growe neare vnto the myne of copperus, whiche runnyng with it in the digeſtion oꝛ naturall concoction, hyndꝛeth it of perfectiõ, maketh it to ſhynke, and to be eaten of a greane ruſt. Muche a doe the Alcumiſtes haue to turne it into golde, if it might be, they diſpute very reaſonablye, and conclude almoſte neceſſarily in their talke, that it may be conuerted into golde as, a body,

that wāteth litle of perfectiō which may be easely added vnto it. But in conclusiō of the worke, it is an harder matter, to bryng it to passe, then it was to purpose before they had done it, to builde an abbay at euery myles ende, vpō Salisbury playne, as one was mynded.

¶ *Of Tinne.*

Tinne. TYnne, wherof great plenty groweth in the West partes of Englande, in bewty and collour cōmeth neareſt to siluer, & of siluer wāteth nothing, but solidite & hardnes. For tinn is a rawe & vndigested metall, also very porose & vncō pact, which causeth it to crashe, when it is broken or bitten. So it faileth of heat, in the cōmixtiō & also sufficiēt digestiō in the earth. Otherwise it is a fayre & profitable metal, to serue ỳ vse of thē, vnto whom siluer & gold are not so plentiful.

¶ *Of Lead.*

Lead. LEad also found in great abūdance wᵗ in this realm, is a rawe & vndigested metal, as tin is, but yet of better digestiō thē cōmixtiō. For it is mixed, wᵗ a grosse earthy substance, which maketh it to be in collor so black, & so fowl to corrupt. So that of ỳ same fumes & *exhalatiōs*, which if they

se they had ben pure & well digested, if ỹ place & matter wold haue suffered, shold haue ben concreat into siluer, for lack of the same, lead is generated, which comming plentifully, doth better seruice thẽ syluer.

¶ *Of Iron.*

IRon the most necessary and profitable of all other metalls, & yet as ill vsed of many as any other, is generated of such substaunce as syluer is, but myxed with a redde minerall, whiche eateth it with redde ruste, and also being of two extreme digestion, passing all other metalls in hardenes. And as other metals to the perfection of syluer, wante sufficient cõcoction, wherby they comme not to the same hardenes: so Iron passeth and exceadeth syluer in immoderate digestion. But though it come not to the perfectiõ of syluer, God forbidde that al Iron had bẽn tourned into syluer, for then we should more haue mysled it, then syluer or golde, the want of whiche would hinder vs nothyng at al. *Iron.*

¶ *Of Quicksiluer.*

THough quicksyluer, be no metal, yet because it is the mother of al metals, some thynge is here to be spoken of it. *Quicksyluer.*

There be diuerse and sondrie opinions, both of the generation, and also the qualities of it, whiche make the generation to be harde to fynde out. For if the qualitie were certainly agreed vppon, there were an easier waye founde, to trye out the generation. Some affirme, that it is exceading whott, and that they wolde proue, by the swyfte percing ther of into other thynges, that be porose. Other saye, it is exceadyng colde, & that they proue, by the exceadyng weyght of it. As for the percyng, they saye: is caused of the exceading moystnes, of which qualitie both partes doe graunte that it is. Concerning the generation, some haue sayde that it is pure and elementall water, some agayne hath thought, that it droppeth out of heauen, and is a part of the heauenly substaunce. And other sayde, that it is generated in the cloudes, and falleth downe in the field, in a circle, on those round circles, which are seen in many fieldes, that ignorant people affirme to be the rynges of the fayries danses. It is certayne, that quick syluer hath dyuerse tymes fallen out of the cloudes, as we haue declared in the

treatise

treatyse of wonderfull and meruelous rayne, but whether it so fall in circles, it is doubtfull. The moste probable opinion is, that it is generated of moyste *vapors* of the earth, coacted by cold, much lyke to water, as brymstone is of hotte fumes coacted by colde, muche lyke to fyer. And thus muche of metalles.

¶ *Of Stones.*

STones the fourth kynde of earthlye myred bodies, haue two maner of generations, by moste contrarie qualities. For heate doth harden moyst bodyes in to stones, as we se that of claye it maketh exceadyng harde brycke. *Stones.*

Also the thonderboltes in the cloudes, are generated by heate, as before hathe ben shewed. But colde dothe by congelyng, generate, many more stones then heate doth: for the moste parte of all the stones that are digged out of the earth, are generated by colde, whiche is able to conuerte any other kynde of myred substaunce into stone, as hath been partly shewed in the nature of welles, and sprynges, of whiche there be some in Englande, whiche by their colde turne wodde or any lyke thyng into stones. I

haue seen a peces of rotten wodde, which to sight was very light, and like wodde, but in handling a very stoone that was taken out of surye a well. Also of other thynges taken out of the earth turned into stones, I haue seen and founde my selfe, fyes, with heade and wynges, very harde stones, also I haue seen an hart, a byrds tongue, a beastes stone, a peare, a plomme, & dyuerse other things turned into hard stones.

Of the diuerse kindes of stones.

STones may first be deuided into rude and bewtifull, the rude conteine those great rockes, whiche are generated by many smal partes ioyned together, and the commen peble stones, that be found euery where in the earthe, among grauell & on the shore of the sea, or bankes of the ryuers. These are generated of grosse and earthly humors, congeled by colde, and because they be neyther fayre of collour, nor through shyning and also commen, they are contemptible. The fayre or bewtiful stones be either great or small. The great be, as marble of diuerse kyndes, & collors, alabaster & suche lyke which being hard & wel concocted, may

Rockes.
Peblestos
Marble.

may be polished & becõ bewitful. Their collor is as they are mixed, being vncongeled, so is their purenes. The small are more pretius, and they be either thick or pellucide. The thicke, be nether so fayre nor so prẽtius, as the *Achates*, the *Iasper*, *Prassius* &c. These cõsisting of a pure matter & not very watry, are congeled into such stones. The clear stones be liquors concrẽt, as the *Diamond*, the *Saphir*, the *Emeralde*, &c. they ar praysed of their gretnes, hardnes, clearnes, & faire collors, of which, enough hath bẽn spoken. Sauing that som be of opinion, ỹ these be generated by heat, because ỹ best ar foũd in whot coũtries, in ỹ east, & in ỹ south. Answer may be made, ỹ the whotter ỹ ayre is the colder is the earth, so that reason is of smal force.

Achates
Iasper.
Prassius.
Diamond
Saphir.
Emerald
The praise of precius stones.

Of the vertue of stones.

SOme perchance, would loke that we shold make a lõg discourse of ỹ vertue of stones, & wold be well cõtent that we shold entreate of diuerse ỹperties of *gemmes* and pretious stones. Which matter though it be out of our purpose (whiche cõsidereth only ỹ generatiõ) yet seing it is not out of their expectatiõ som thing briefly & yet

The vertue of stones.

sufficiently shalbe saide, of the vertue of stones.

The vertue of stones either natural or magicall.

That vertue that is ascribed vnto them, is eyther naturall or magicall. Natural vertue is either that whiche is knowen to haue a naturall cause, or a naturall effect, as the *Magnes*, or loadestone to drawe iron, whiche is by a similitude of nature, and suche an appetite, as is betwene the male and the female.

Magnes.

Also the sayde *Magnes*, moueth towarde the North, and as some saye, there is an other kynde founde in the South, that drayweth towarde the south. They saye, that there is great hylles of this stone, inthe North and South, which maketh it loke that waye.

Other wyng a *Mathematicall* reason, whiche because it is more curius then can be vnderstoode of the commen sort, not exercised in *Geometrie*, I omitte.

Gett and amber draweth chaf

The gette and amber draw heares, chaffe, and lyke light matter, but beyng before chaffed, for heate is *attractiue*.

Astroites a stone moueth in viner.

Also the precious stone called *Astroites*, moueth of it self in vineger, the sharpenes of the vineger, percing it, and the ayer excluded, driuing it forward. These

vertues

vertues because I haue seen, I haue set for an example, generally all other lyke naturall vertues, proceade of lyke naturall causes, which by their effect the ingenious must seeke to fynde out. As for *Magicall* vertues be they, whiche are grounded of no reason, or natural cause whiche if they take effect, it is rather of the superstition & credulitie of hym that vseth them, then of the vertue of the stones. As that an Emerald encreaseth loue, a Saphir fauoure, a Diamonde strength, & suche lyke vertues of whiche *Albertus* in his age surnamed the great, toke paynes to wryte a booke, whiche I suppose be englished. To conclude with the cause why stones melte not as mettalles doe, may be gathered by ỹ which hath bẽn sayde before, because they are congeled past that degrée, & also because there is left in them no vnctuus, or clammy matter. Let this suffise for stones, & so the whole purpose is at an ende. *Albertus Magnus.*

(.*.)

FINIS. W. F.

THINKE AND THANKE,

FAR AND NERE.

LYE IN FERE,

KNOW ETHY SELFE,

Impyted
at London in Fletestreate, at the
signe of the Faucone, by William
Griffith: And they are to be sold
at his shop in S. Dunstones
churchyarde in the
Weste.
1563.